Team Atlantic

Martin
Engineer

Frank
Engineer

Lauren
Construction
Manager

Rith
Engineer

Astrid
Architect

Lena
Construction
Manager

Cyber Presentation

ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture The Link Corn Silos Water Rings

Engineering

MEP

Construction

Sustainability Review

Integrated Project Delivery

ARCHITECTURE

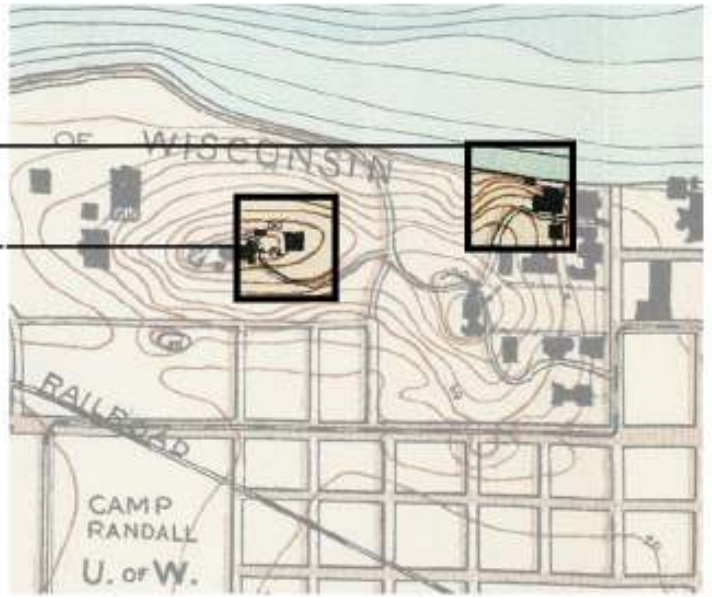
SITE & TOPOLOGY

Wisconsin University

Madison

+03m

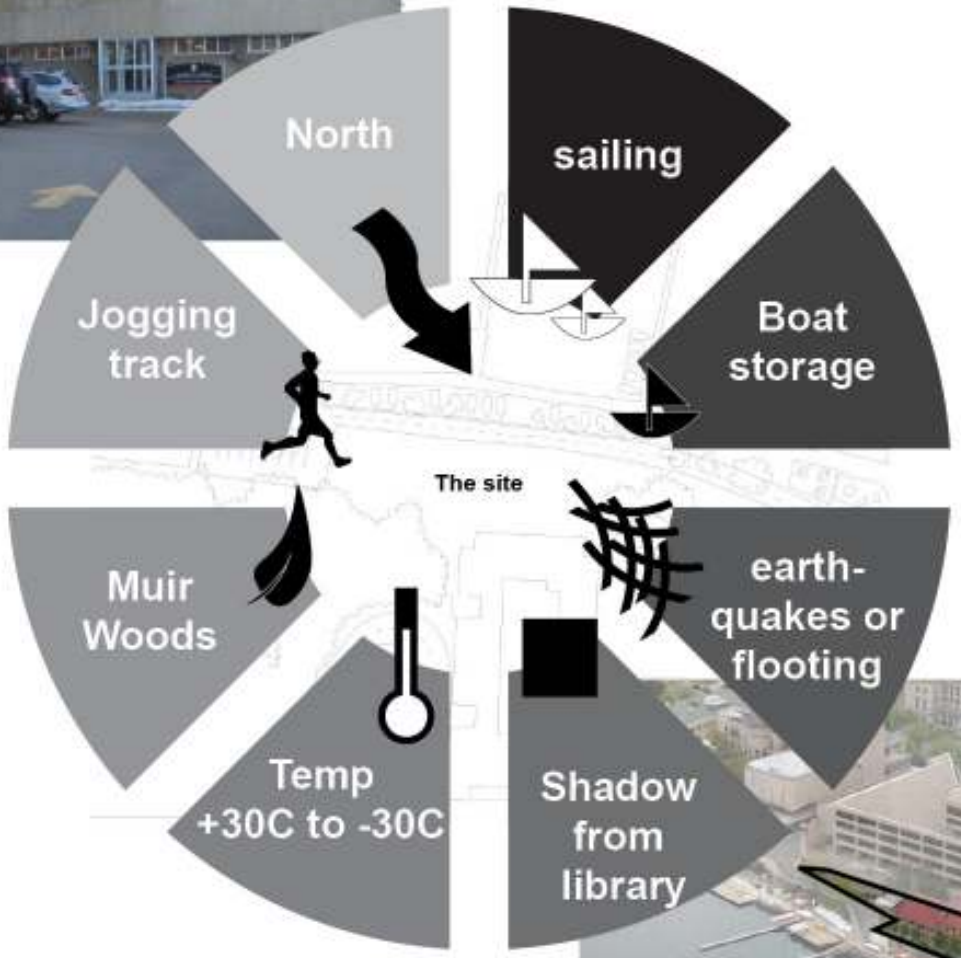
+25m



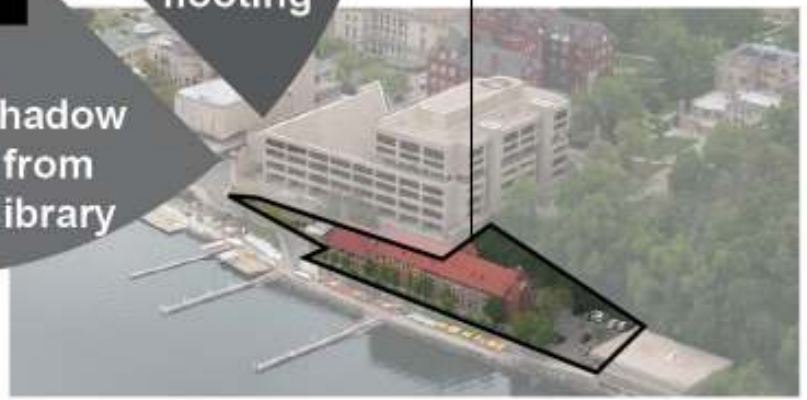
ARCHITECTURE

SITE

Parking lot



The narrow site



ARCHITECTURE

CONTEXT

Classicism
Gothic
Cubism
Modernism
Functionalism

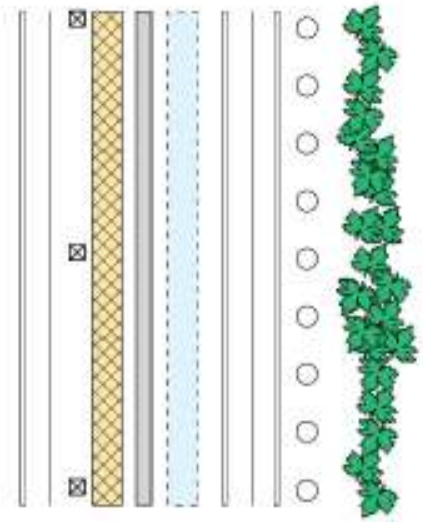
ARCHITECTURE

MATERIALS

Corten steel

Living Wall

Concrete



ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture **The Link** Corn Silos Water Rings

Engineering

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ARCHITECTURE

THE LINK

References

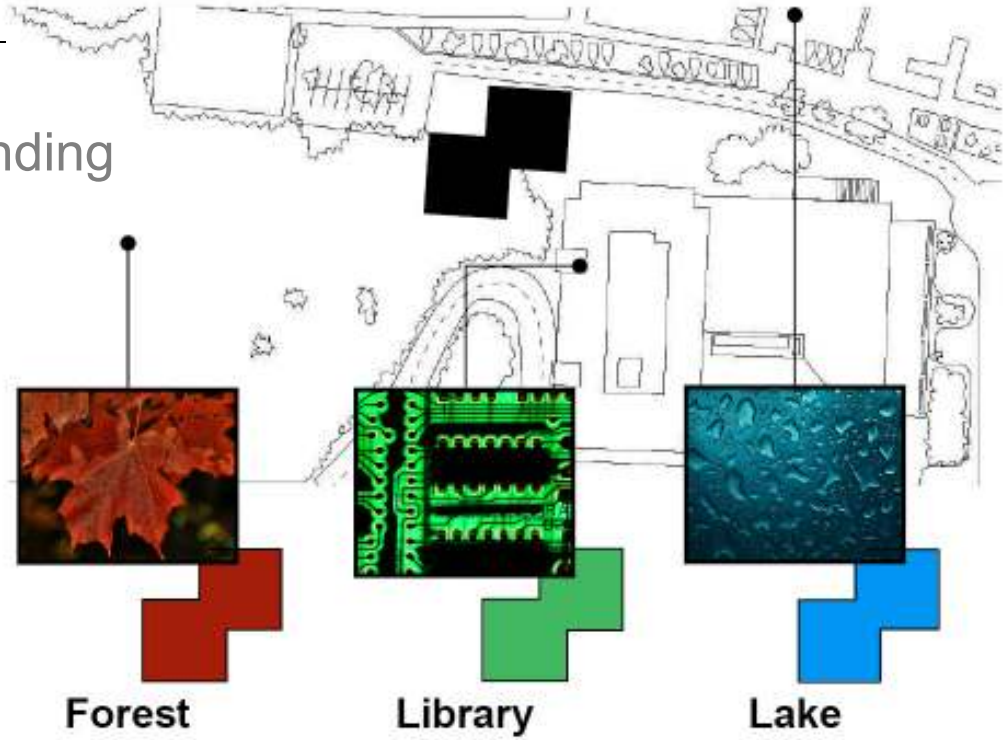
Timber
Landscape
Frank Lloyd Wright
Green facade, Enrique Brown

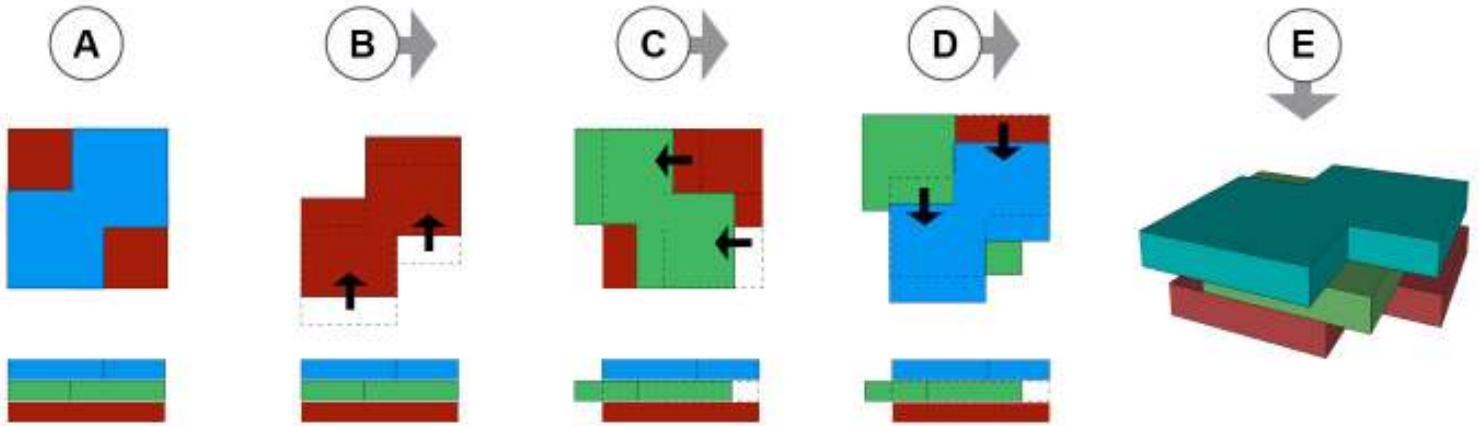
ARCHITECTURE

THE LINK

Big idea

Taking the surrounding resources to a combining link

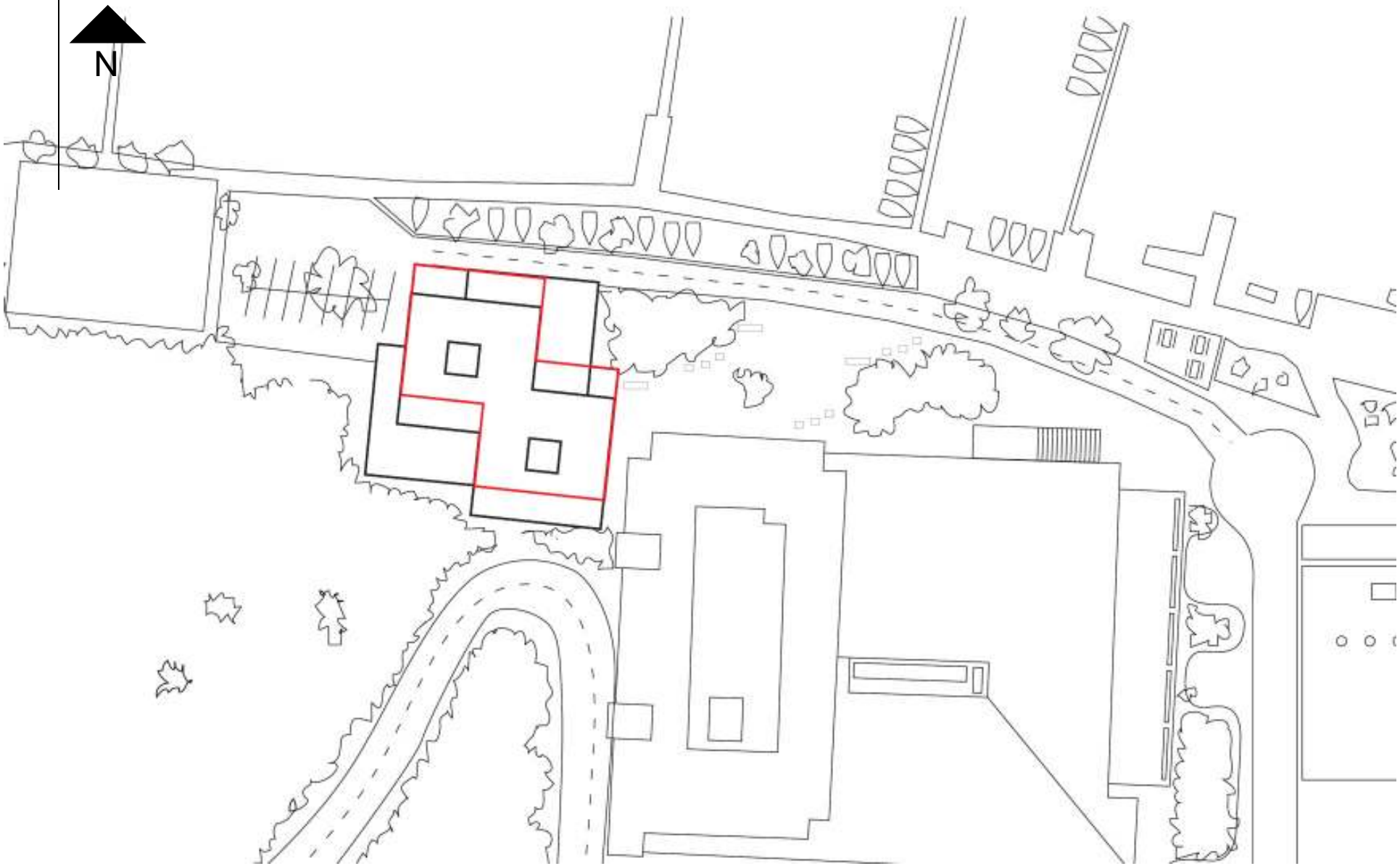




ARCHITECTURE

THE LINK

Site plan



ARCHITECTURE

THE LINK

Basement

N

- Faculty Office
- Department Chairs Office
- Senior Administration Office
- Administrative Assistant
- Faculty Lounge
- Auditorium
- Large Classroom
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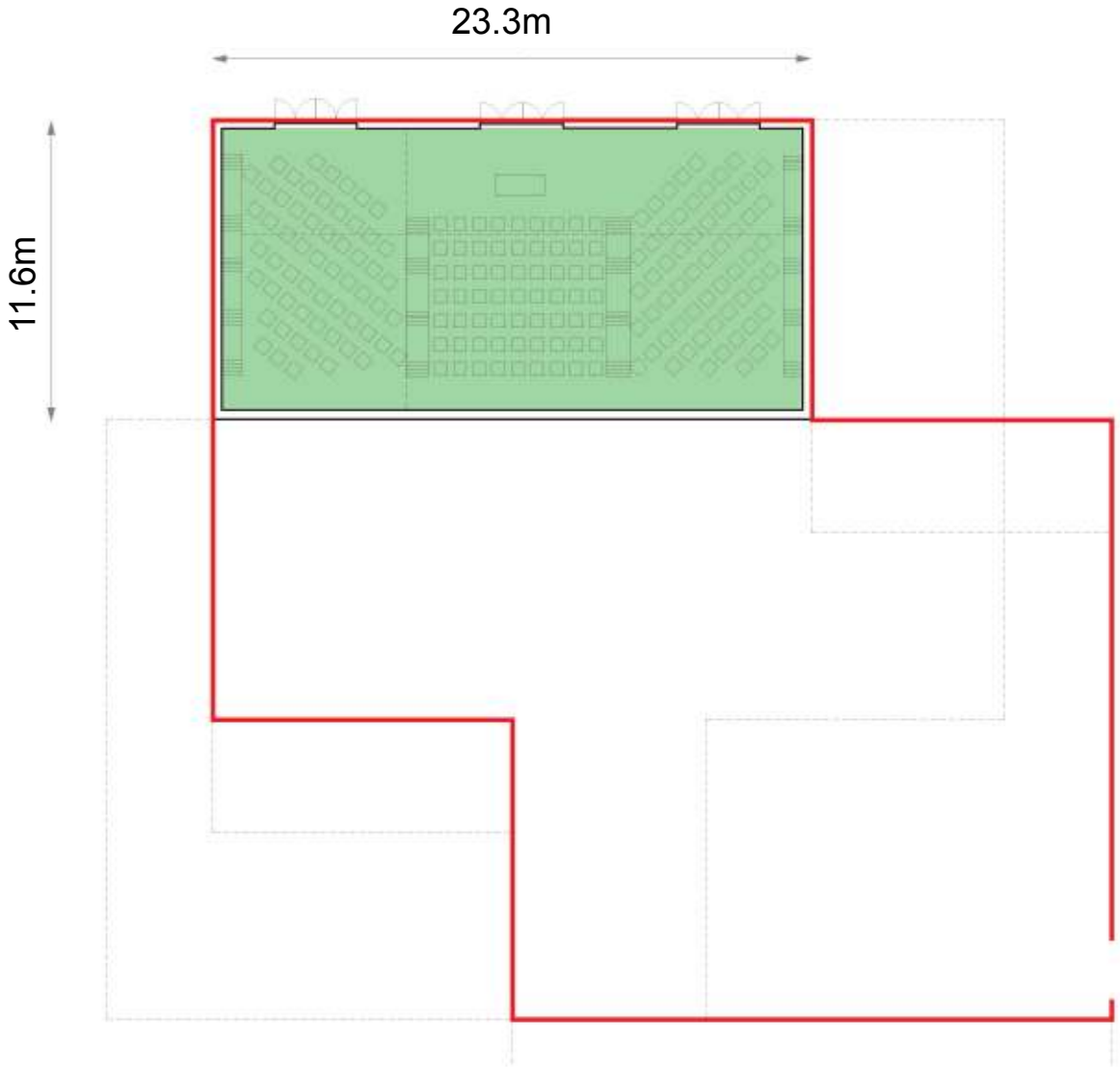
- Storage Room
- Student Offices
- Seminar Room



ARCHITECTURE

THE LINK

1st Floor

ARCHITECTURE

THE LINK

2nd Floor

N

- Faculty Office
- Department Chairs Office
- Senior Administration Office
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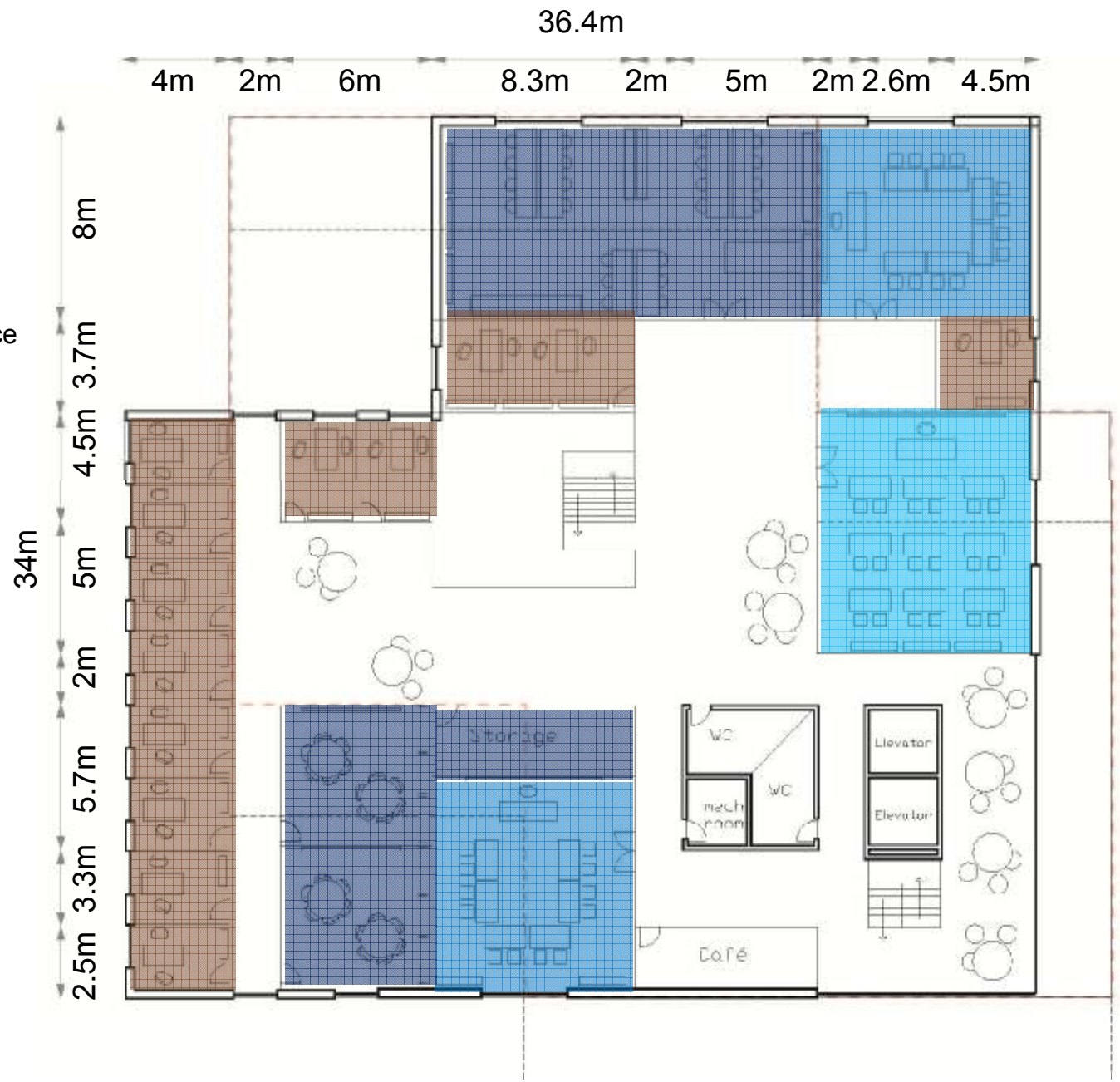

ARCHITECTURE

THE LINK

3rd Floor

N

- Faculty Office
- Department Chairs Office
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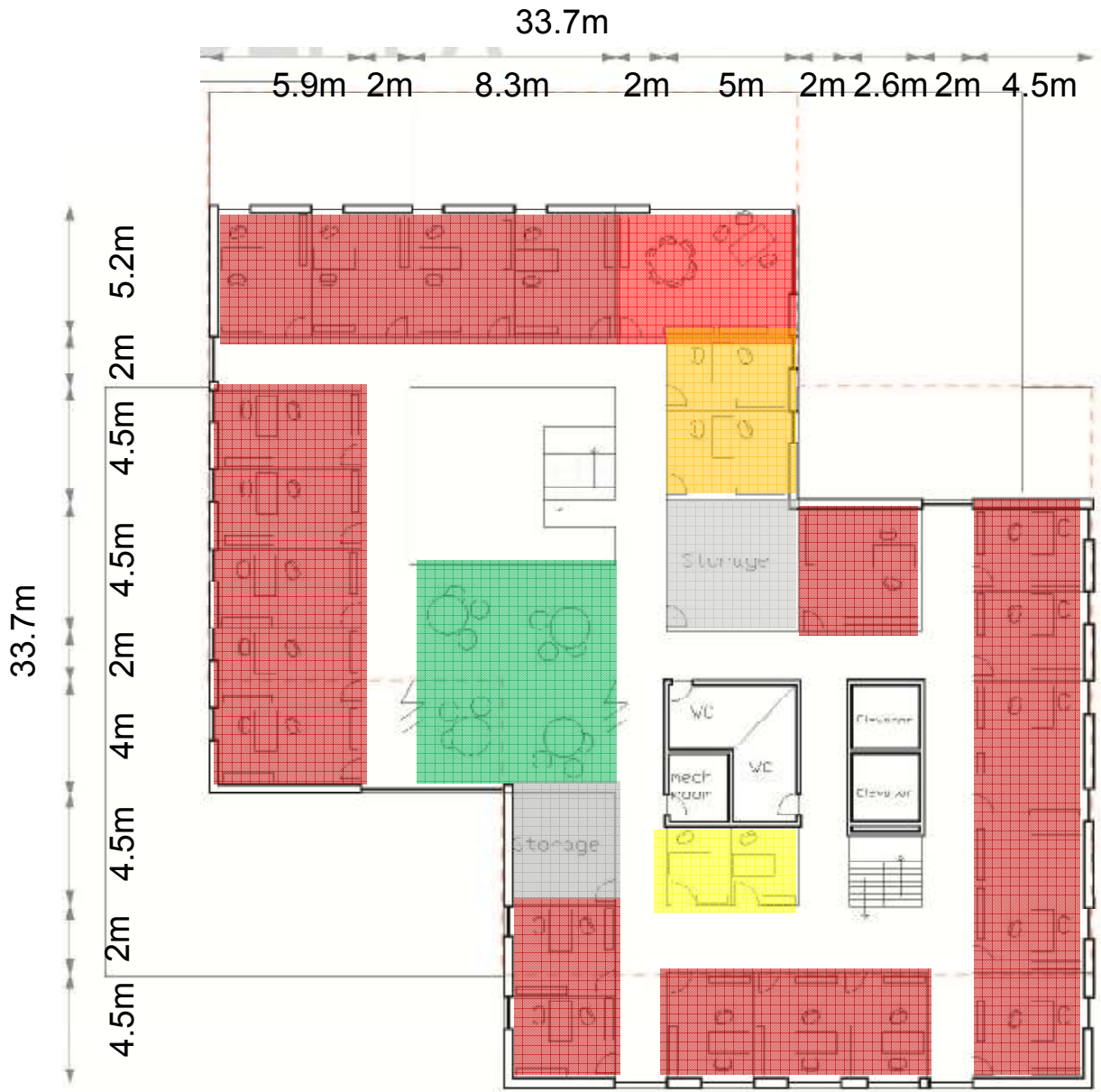
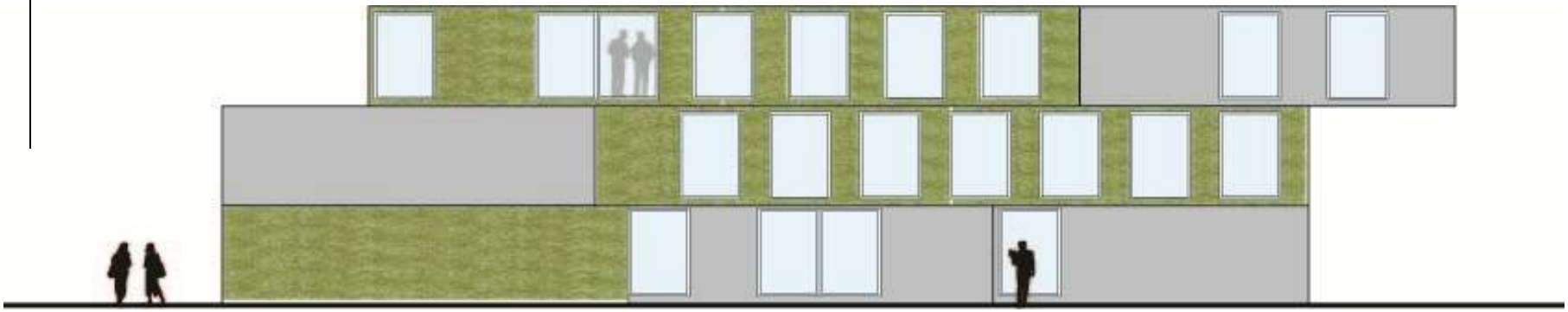


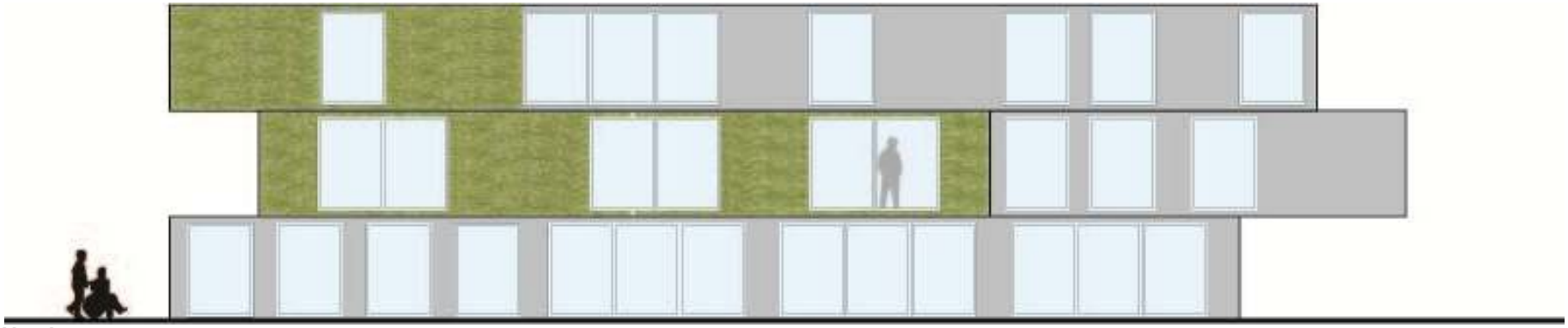
ARCHITECTURE

THE LINK

Elevations



South

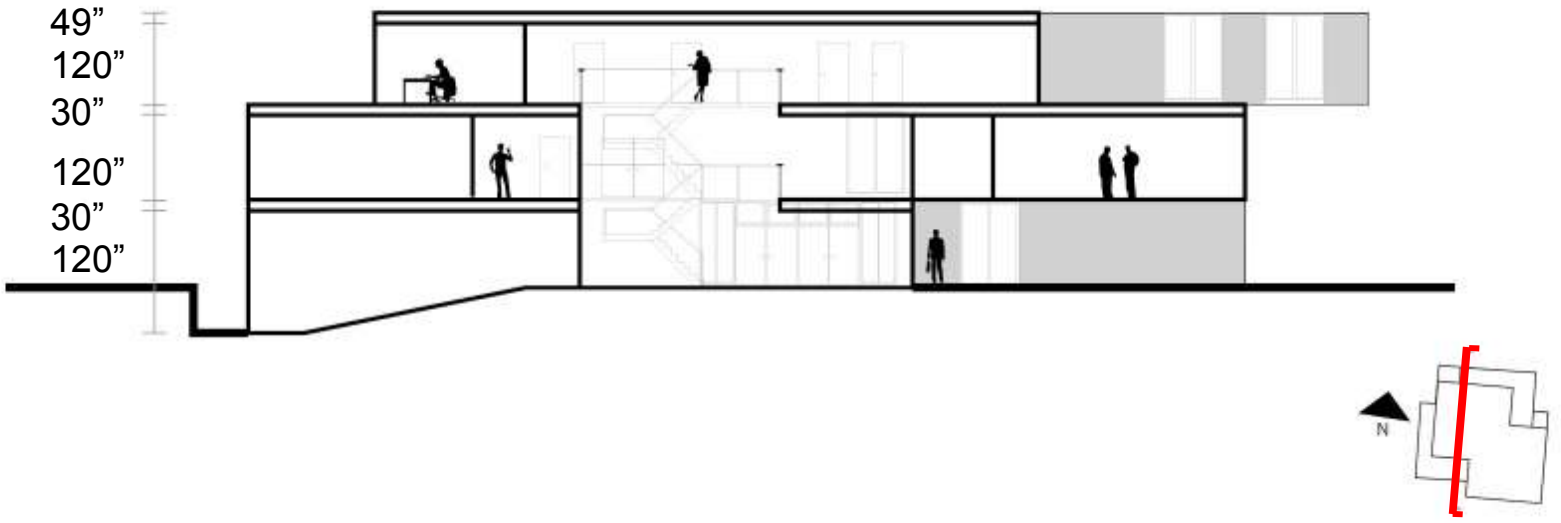


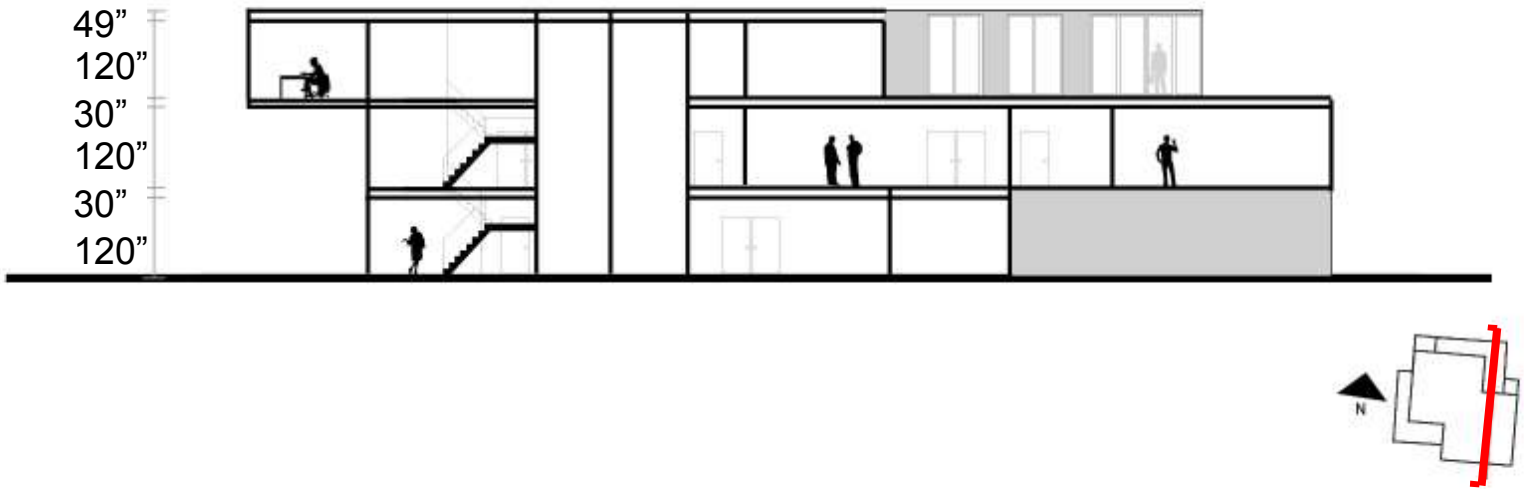
North

ARCHITECTURE

THE LINK

Sections

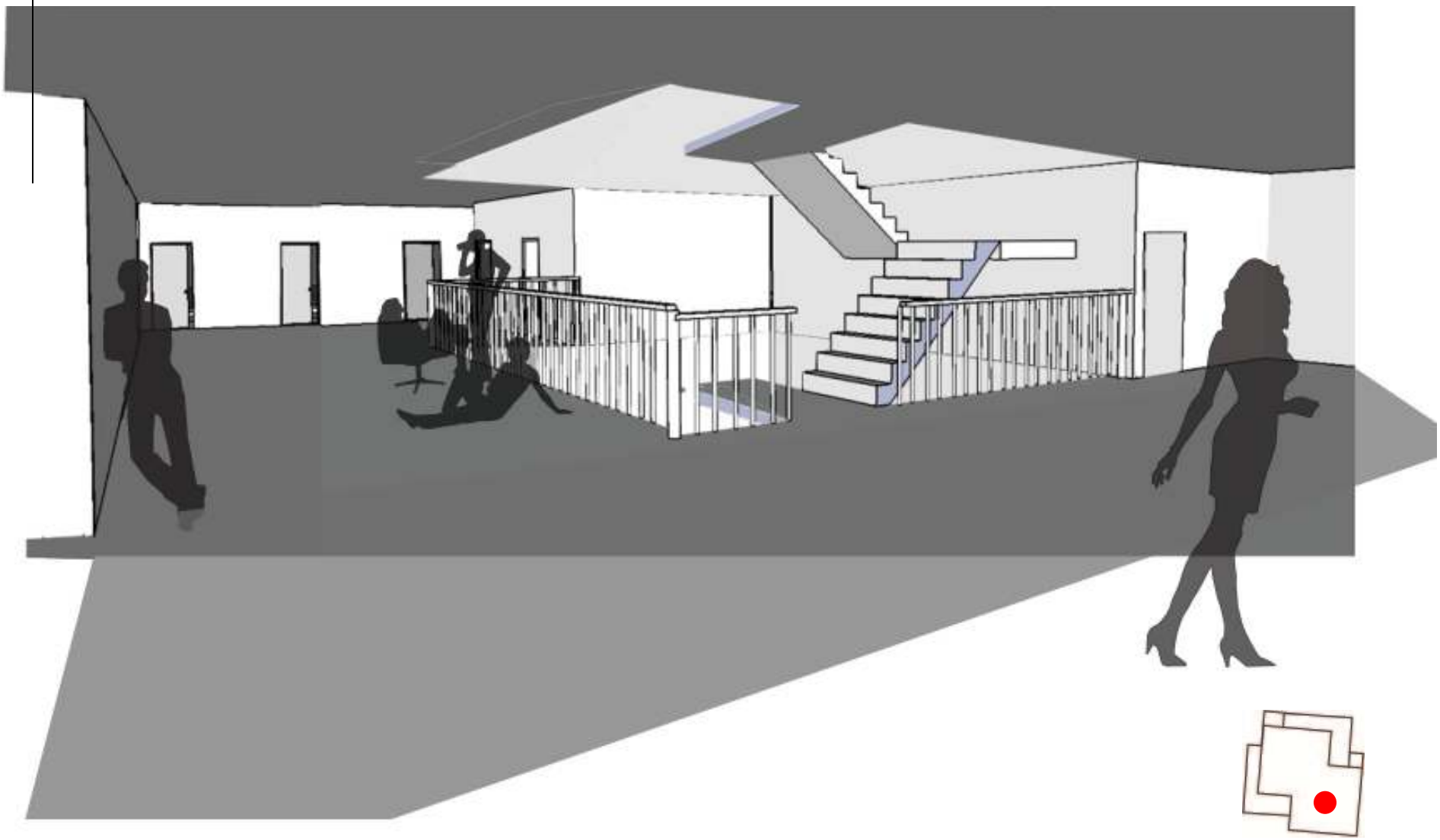




ARCHITECTURE

THE LINK

Visual Indoor



ARCHITECTURE

THE LINK

Visual Outdoor

ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture The Link **Corn Silos** Water Rings

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Construction

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Integrated Project Delivery

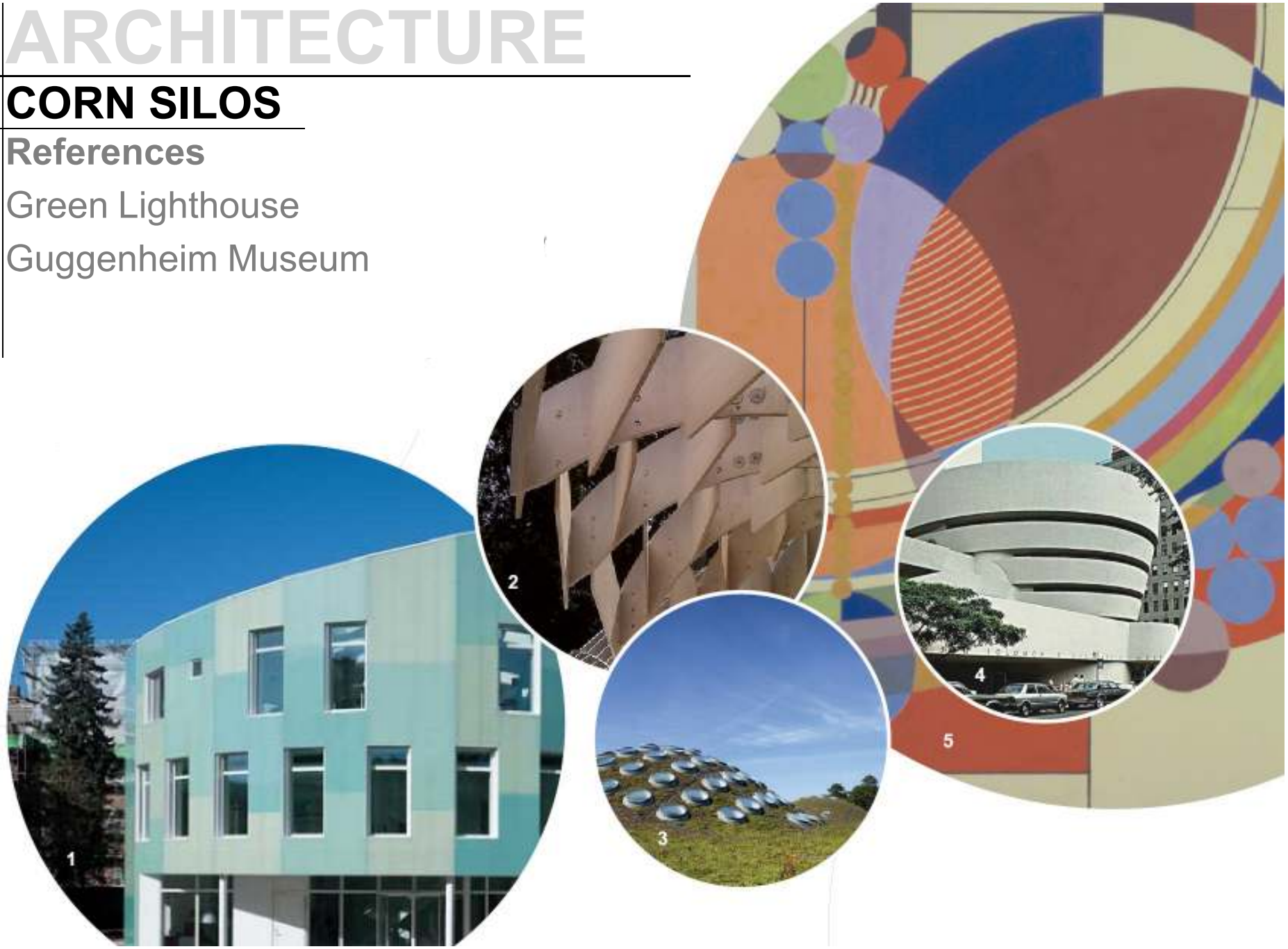
ARCHITECTURE

CORN SILOS

References

Green Lighthouse

Guggenheim Museum

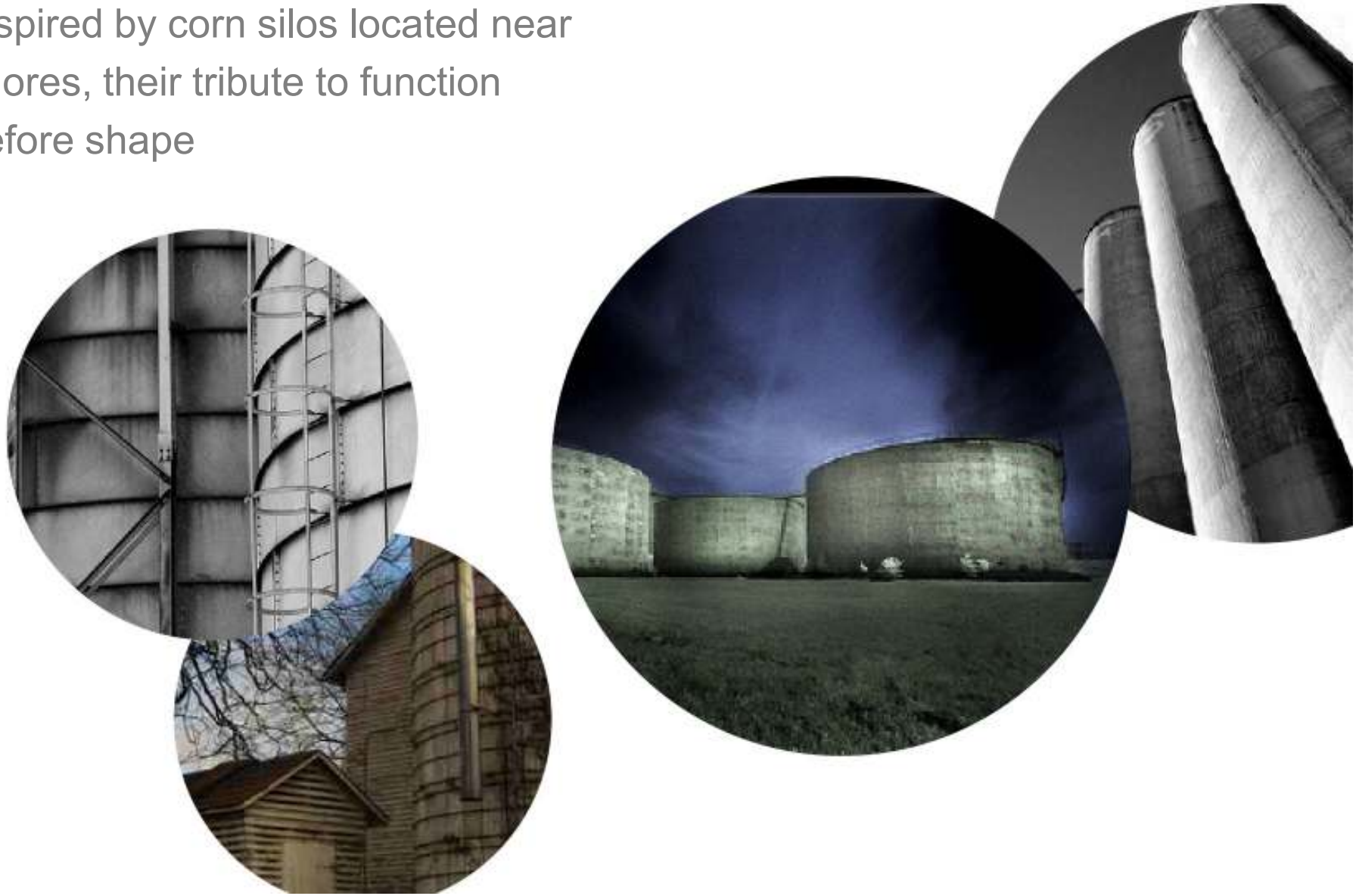


ARCHITECTURE

CORN SILOS

Big Idea

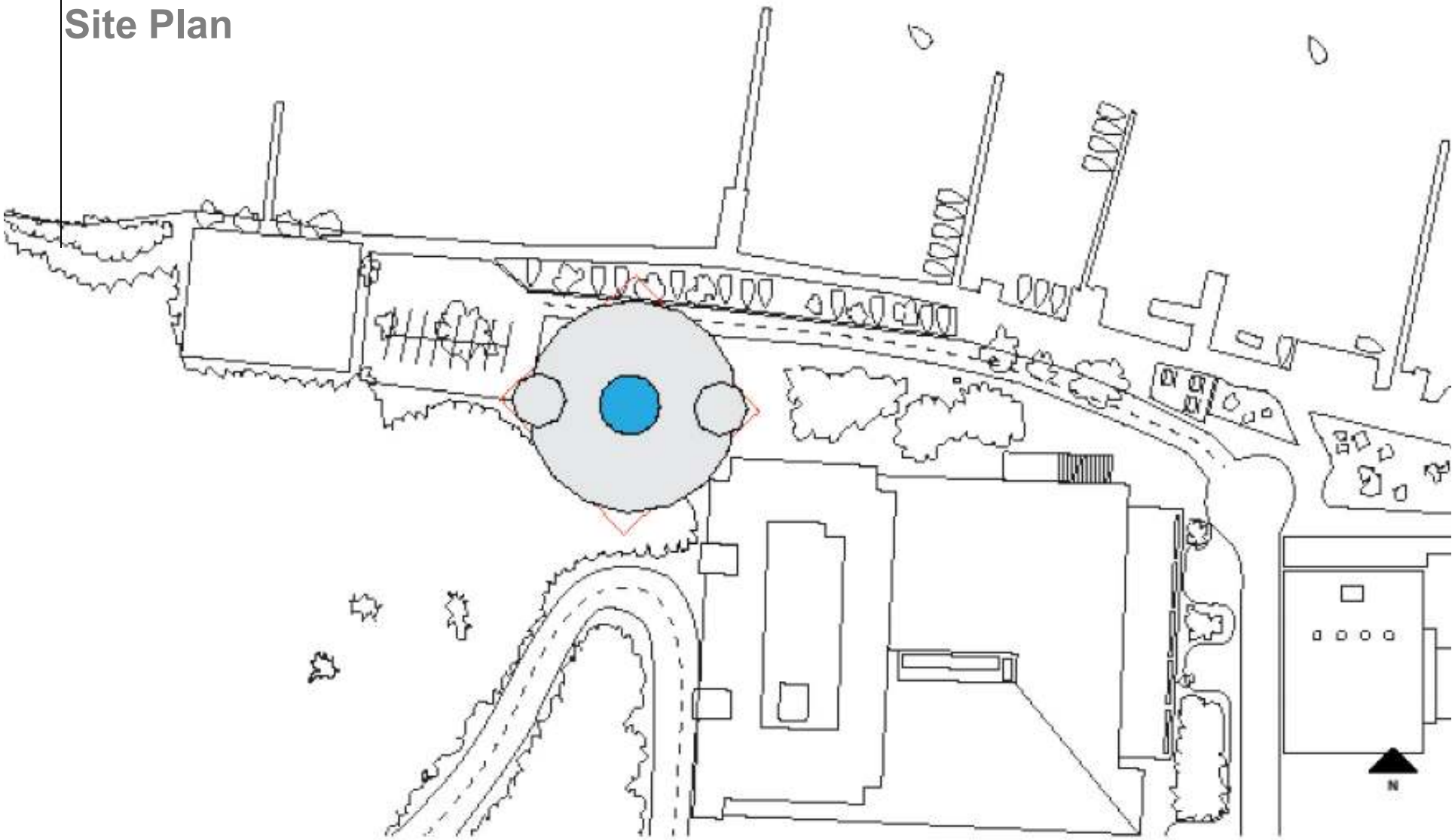
Inspired by corn silos located near shores, their tribute to function before shape



ARCHITECTURE

CORN SILOS

Site Plan



ARCHITECTURE

CORN SILOS

1st Floor

N

- Faculty Office
- Department Chairs Office
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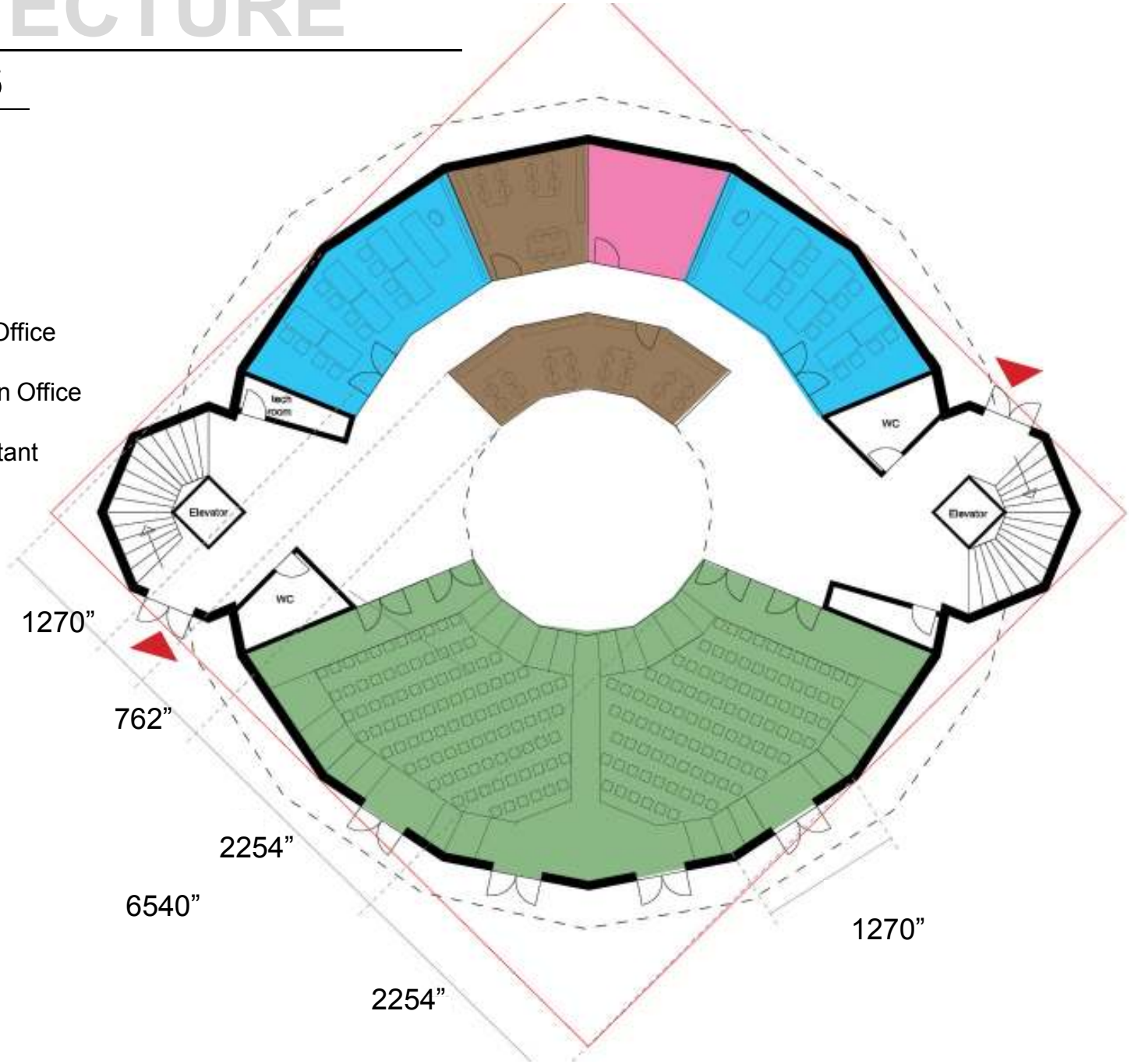

ARCHITECTURE

CORN SILOS

2nd Floor

N

- Faculty Office
- Department Chairs Office
- Senior Administration Office
- Administrative Assistant
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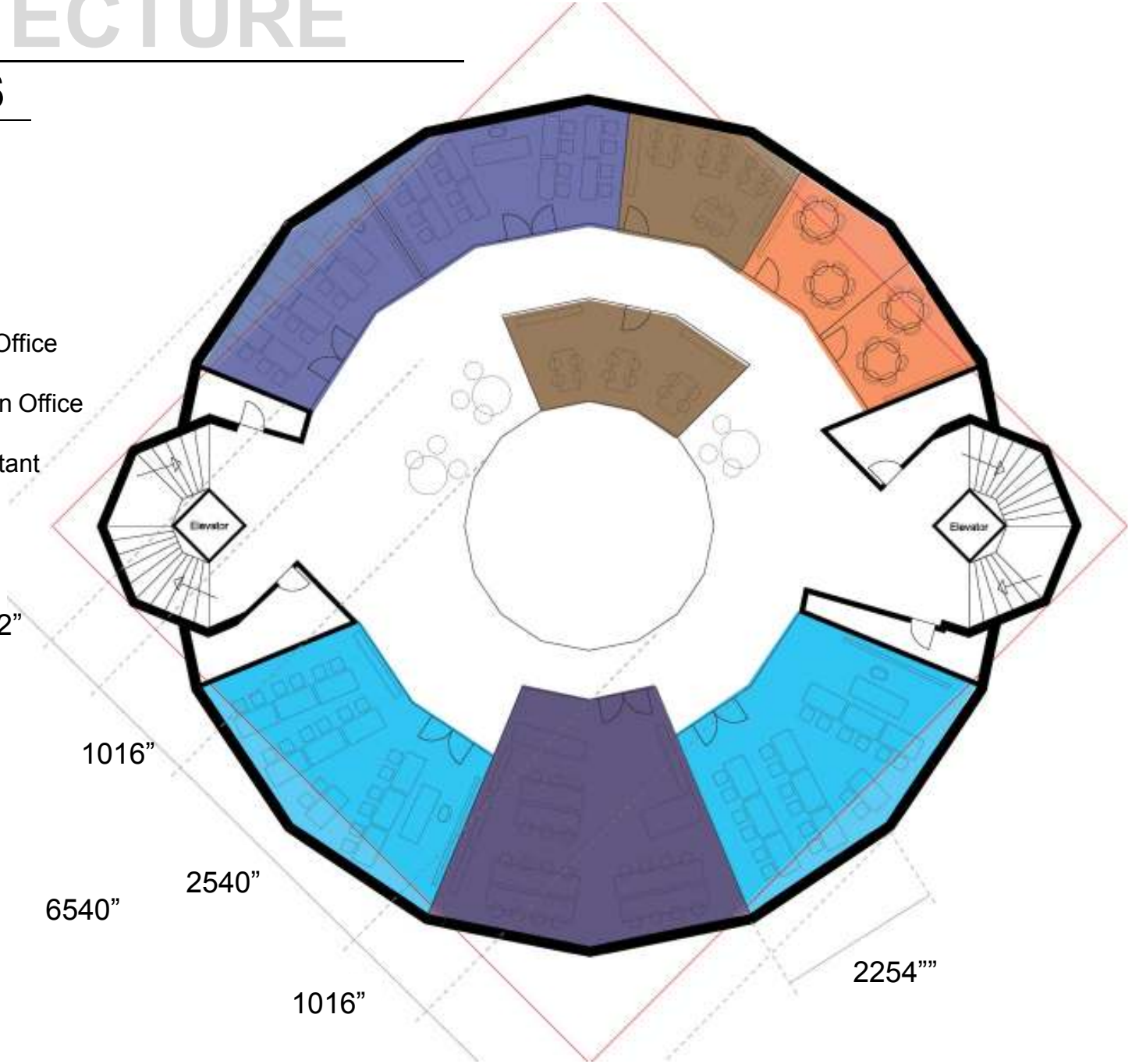

ARCHITECTURE

CORN SILOS

3rd Floor

N

- Faculty Office
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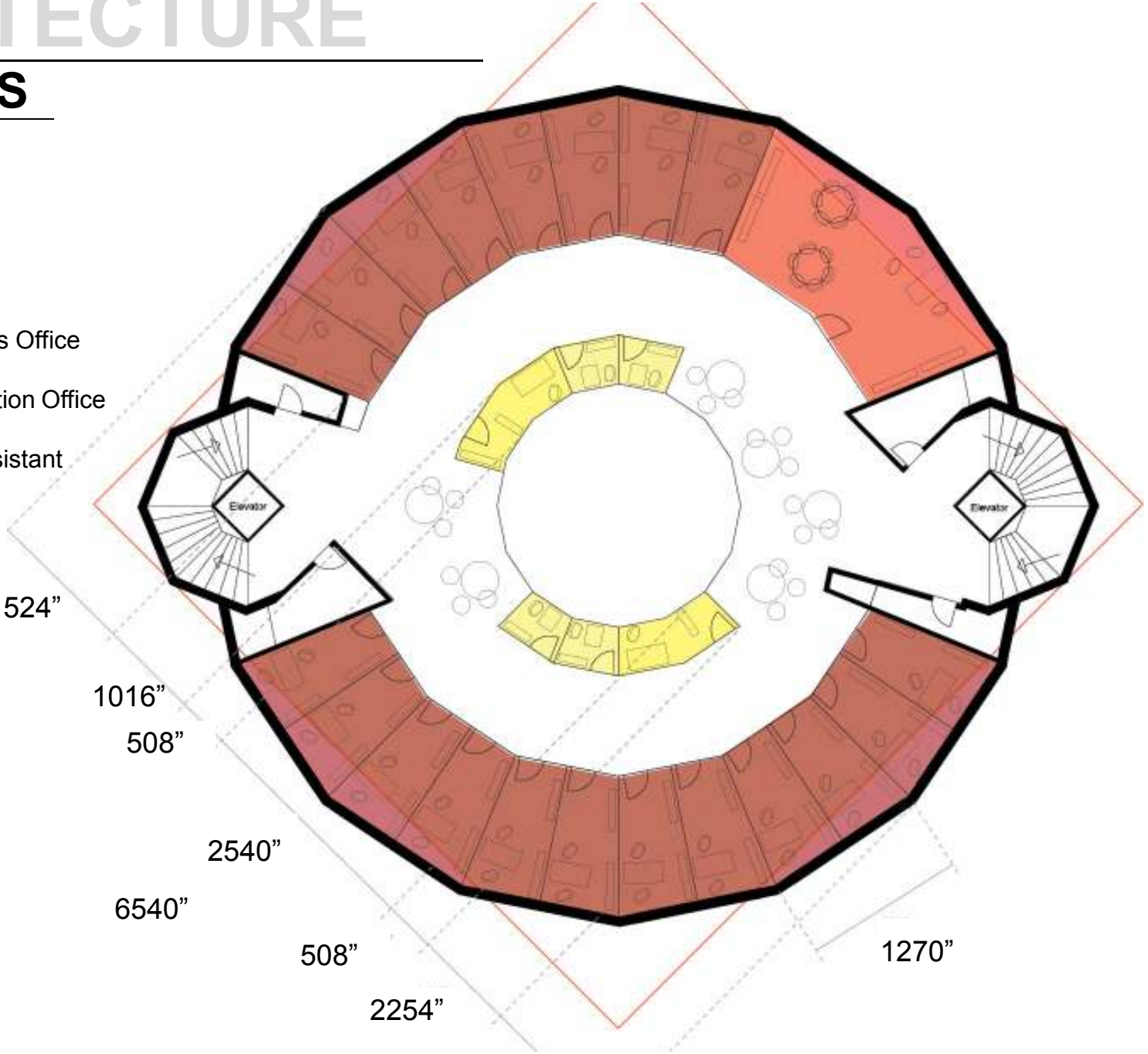
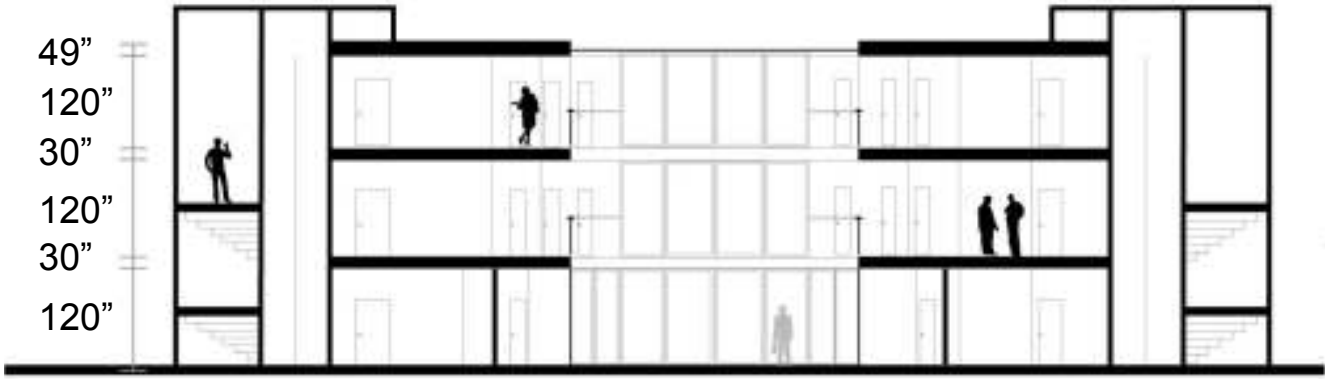
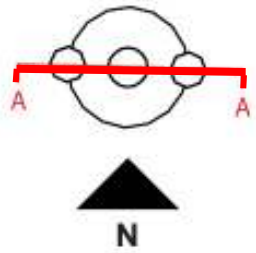


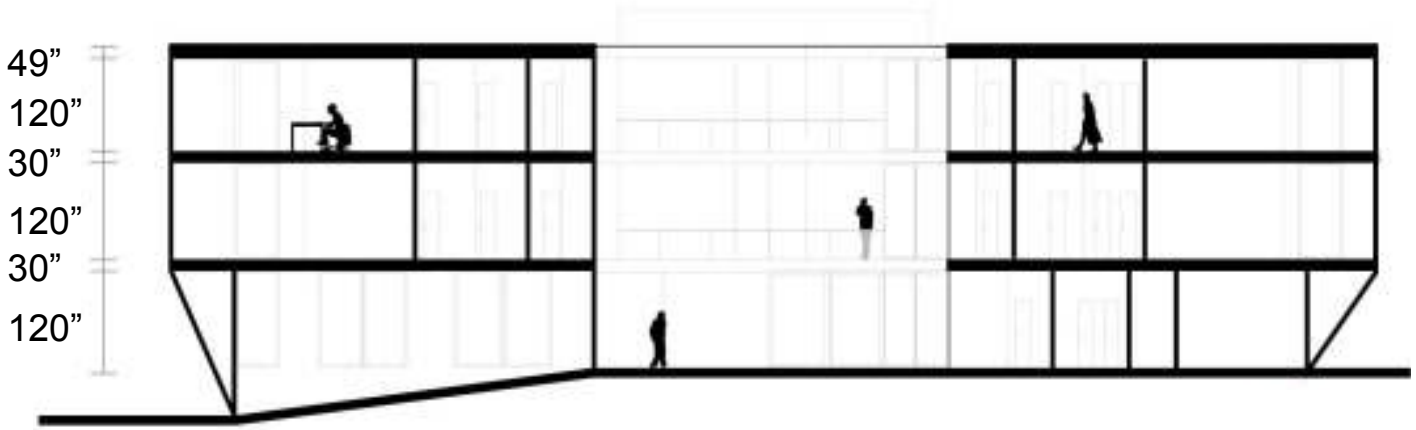
ARCHITECTURE

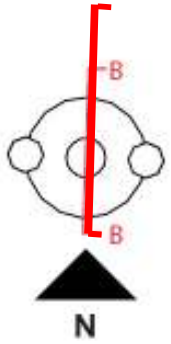
CORN SILOS

Sections





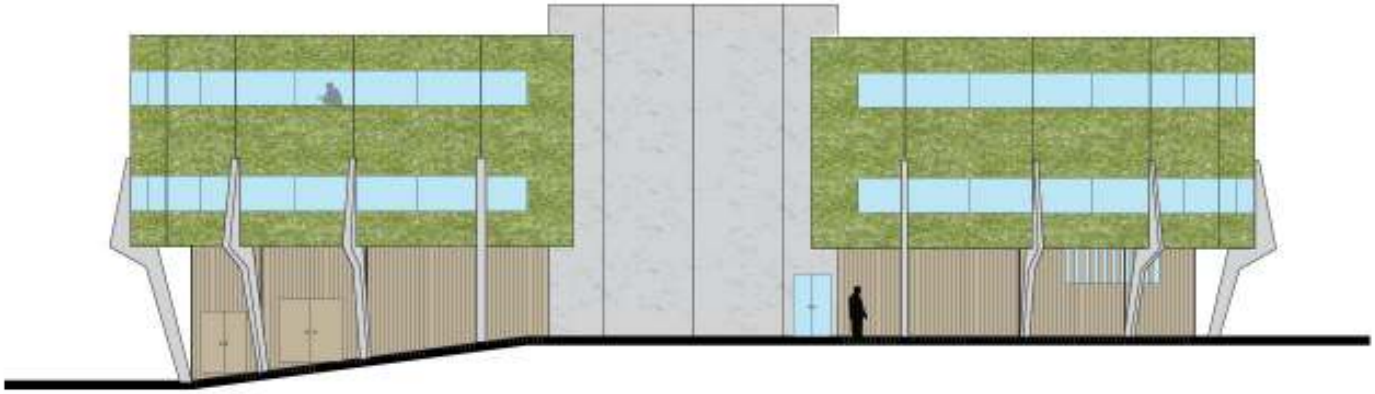




ARCHITECTURE

CORN SILOS

Elevations



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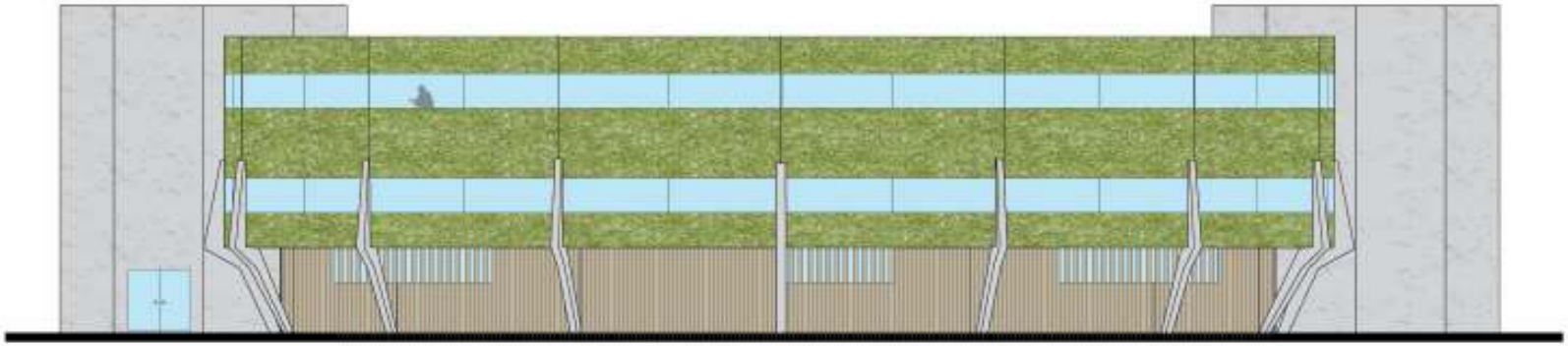
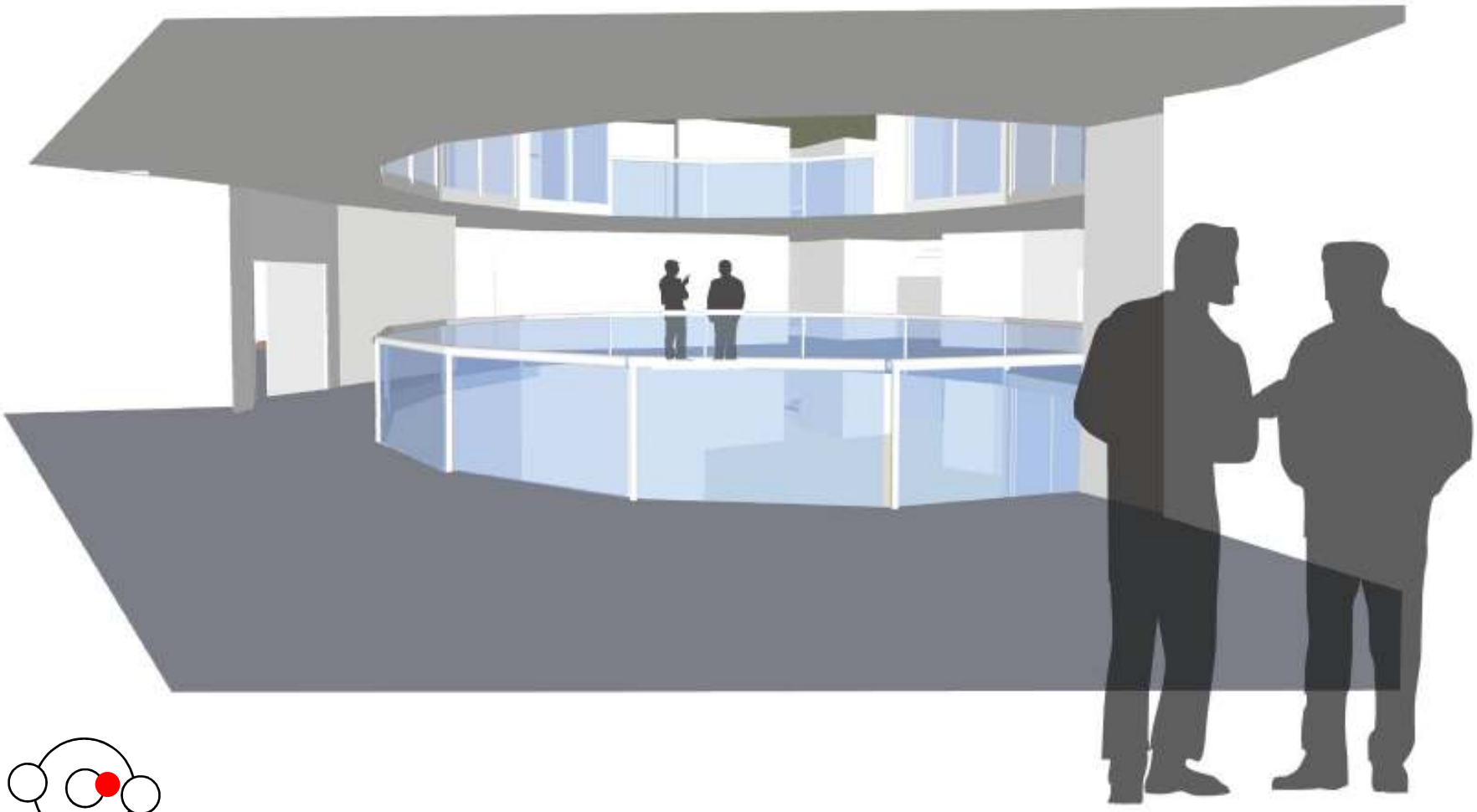


North

ARCHITECTURE

CORN SILOS

Visual Indoor



ARCHITECTURE

CORN SILOS

Visual Outdoor

ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture The Link Corn Silos **Water Rings**

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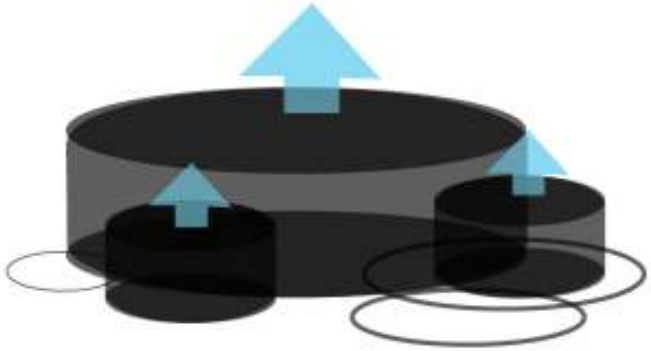
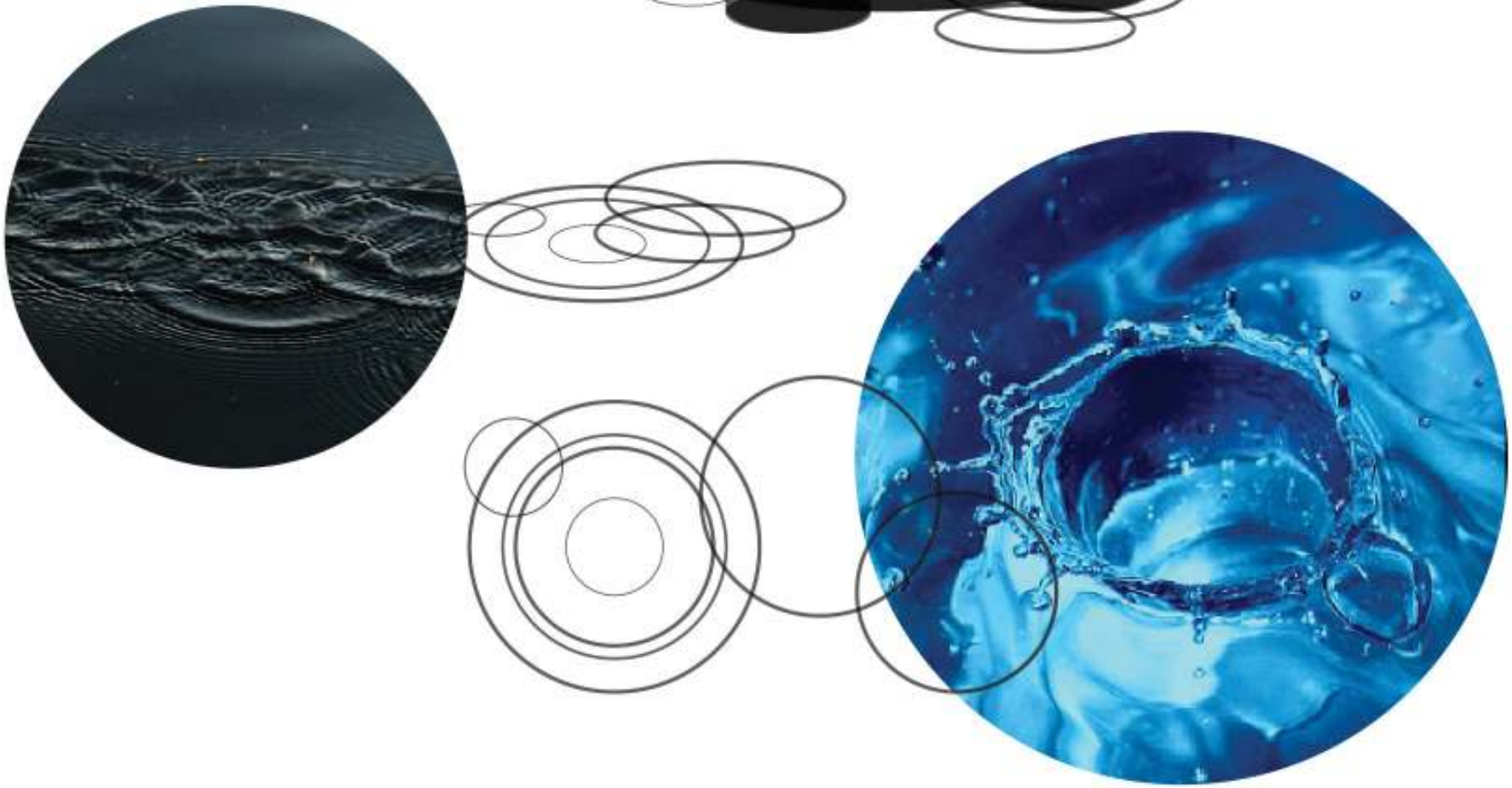
ARCHITECTURE

WATER RINGS

Big idea

Water rings rippling in the lake - captured and made solid

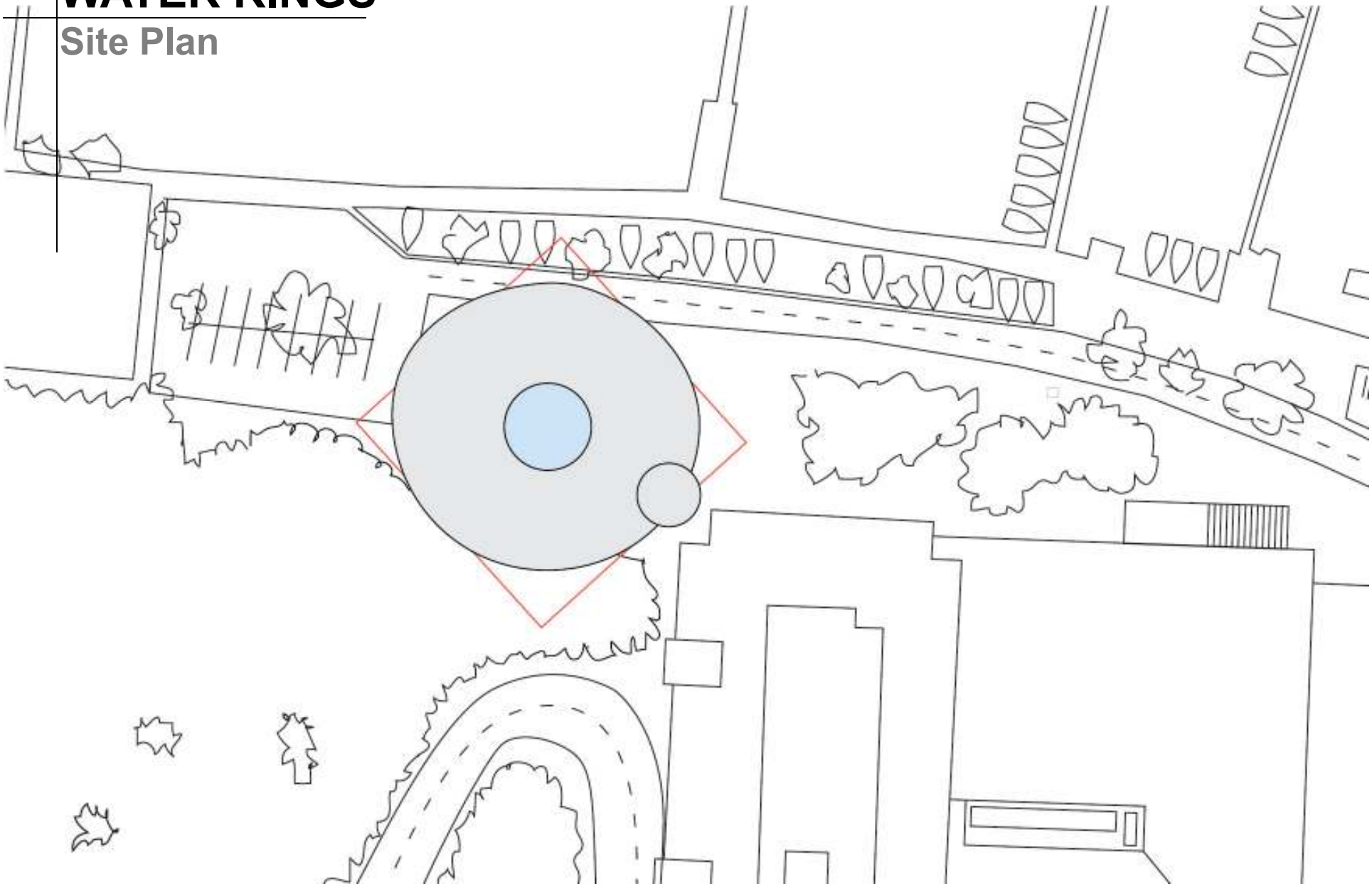




ARCHITECTURE

WATER RINGS

Site Plan



ARCHITECTURE

WATER RINGS

1st Floor

N

- Faculty Office
- Department Chairs Office
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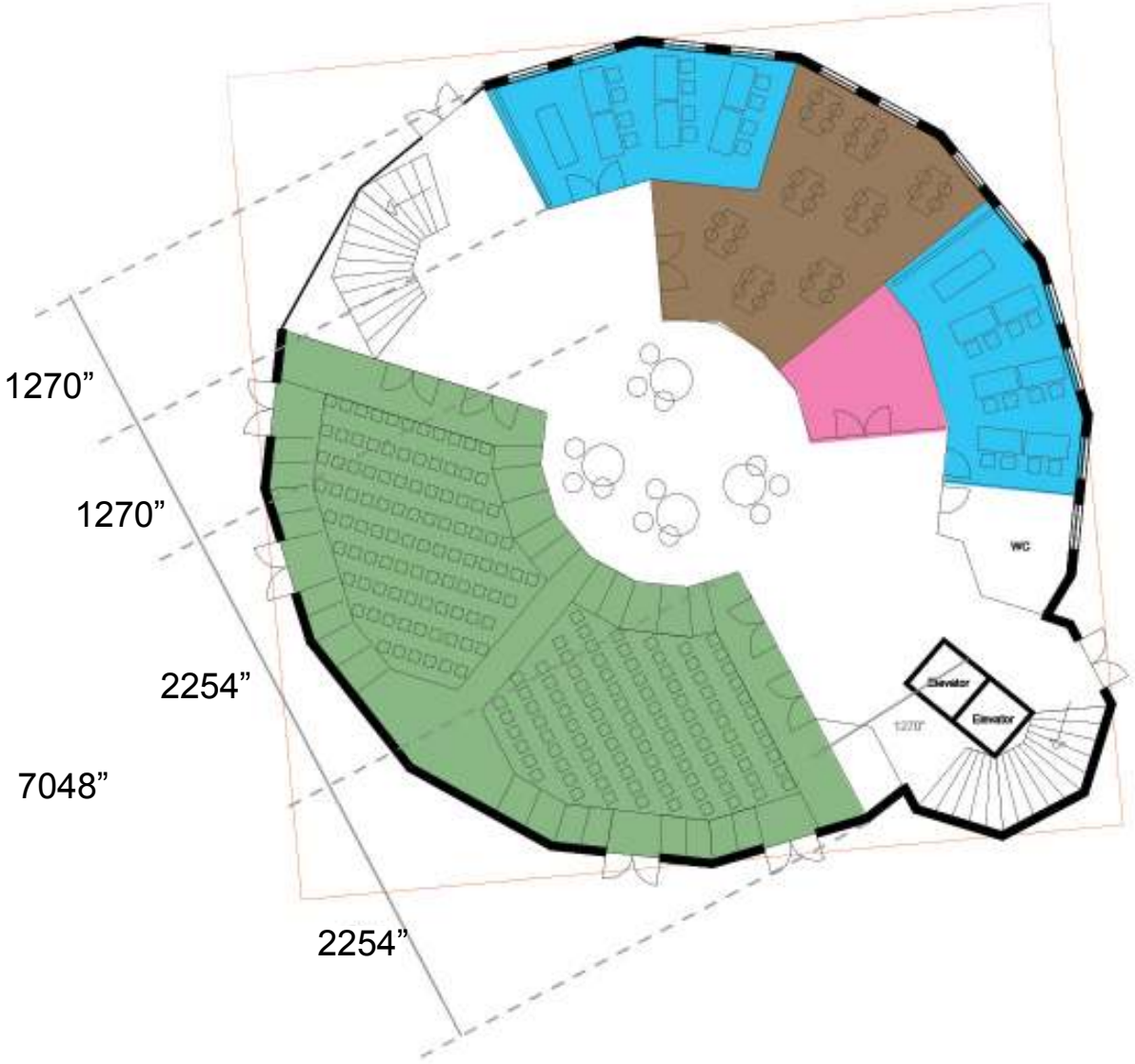

ARCHITECTURE

WATER RINGS

2nd Floor

N

- Faculty Office
- Department Chairs Office
- Senior Administration Office
- Administrative Assistant
- Faculty Lounge
- Auditorium
- Large Classroom
- Small Classroom
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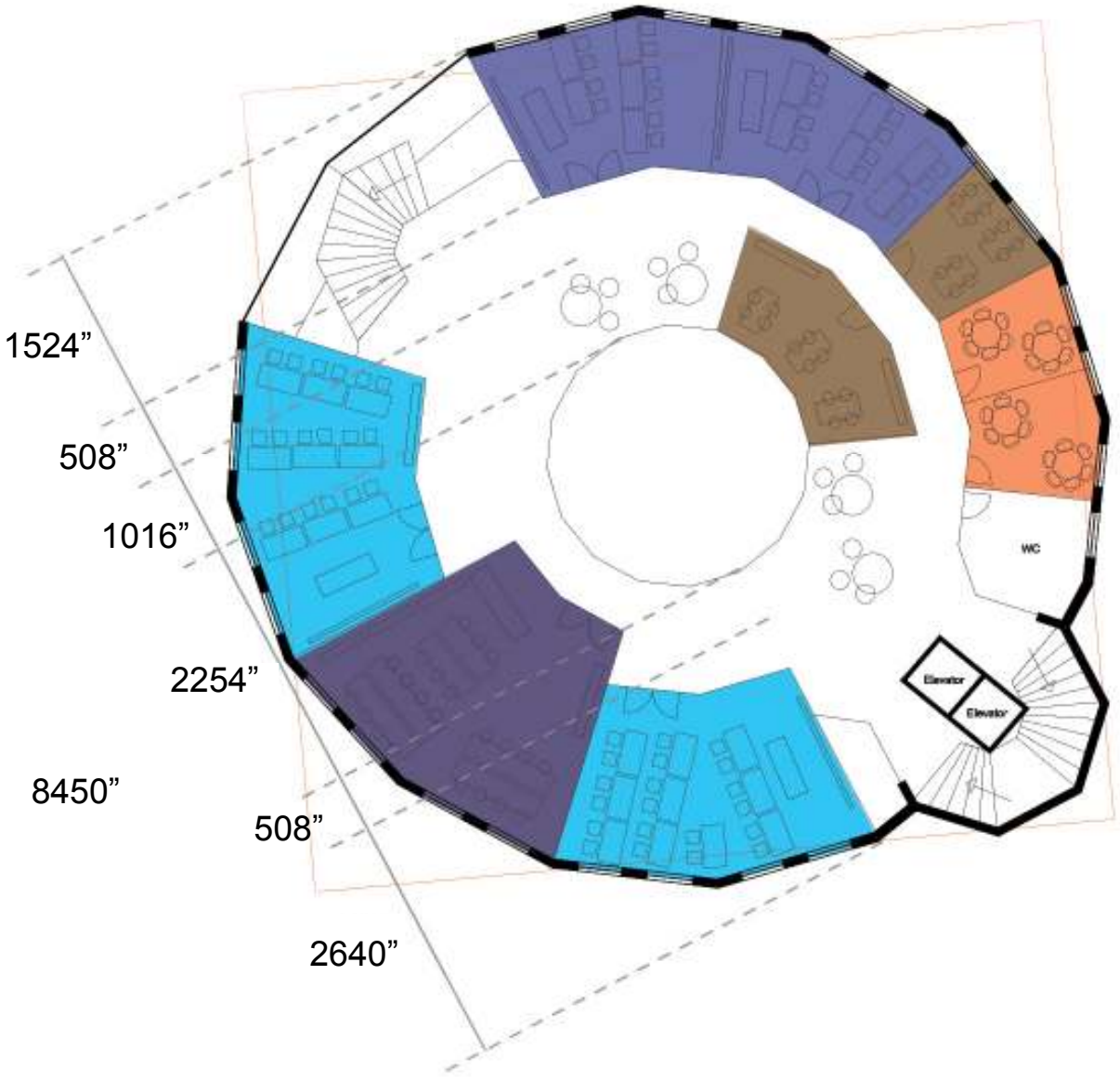

ARCHITECTURE

WATER RINGS

3rd Floor

N

- Faculty Office
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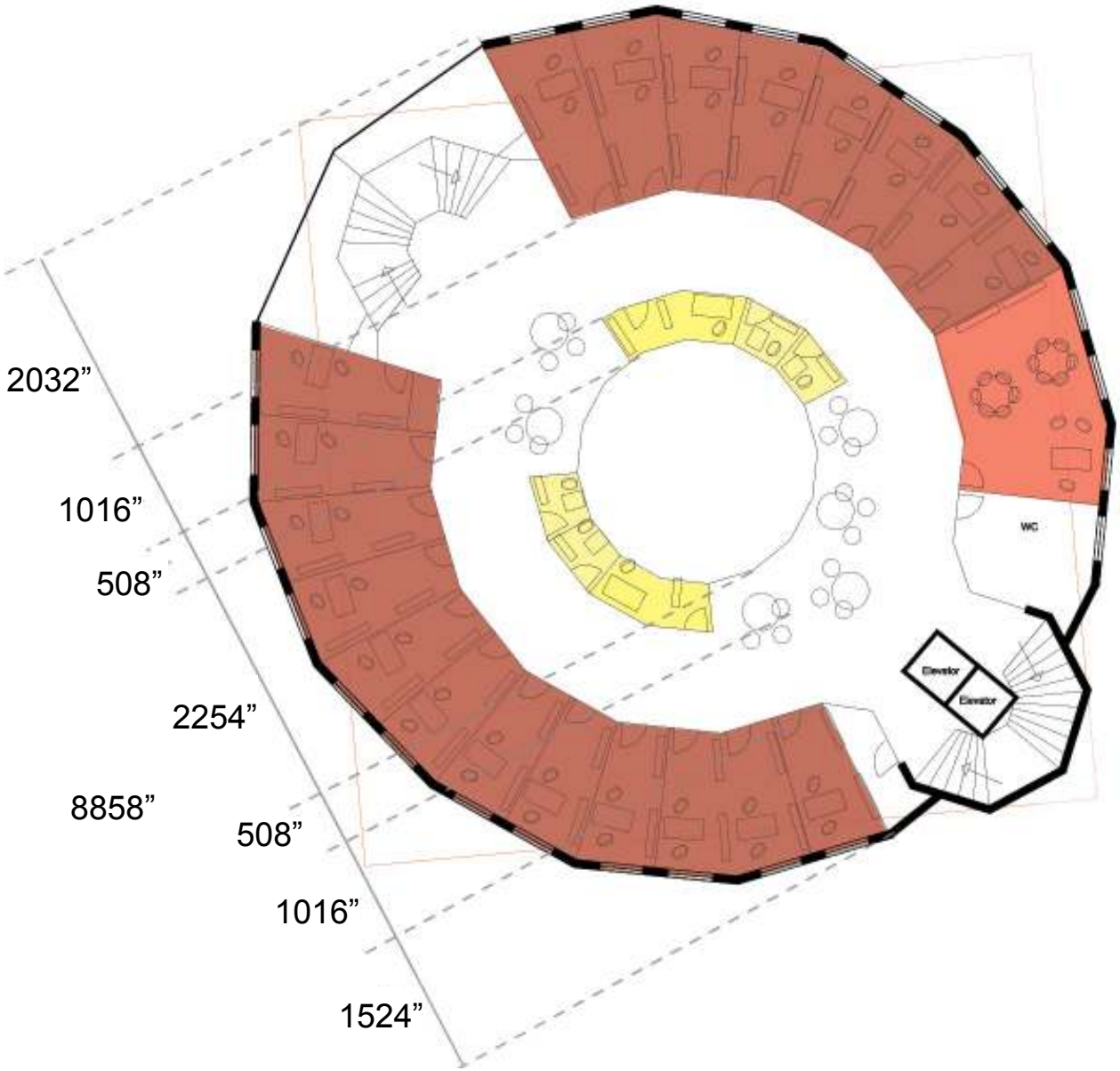
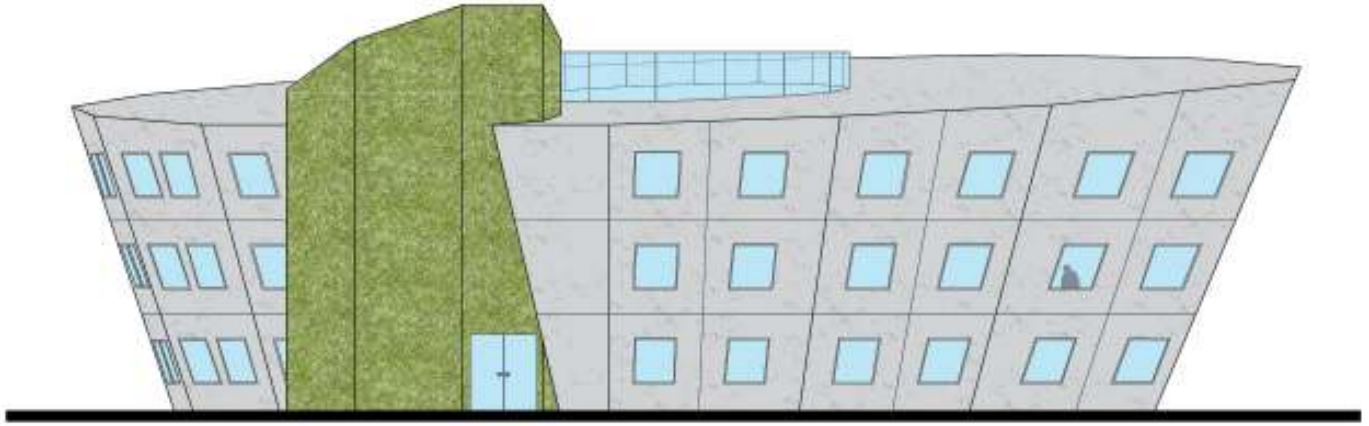


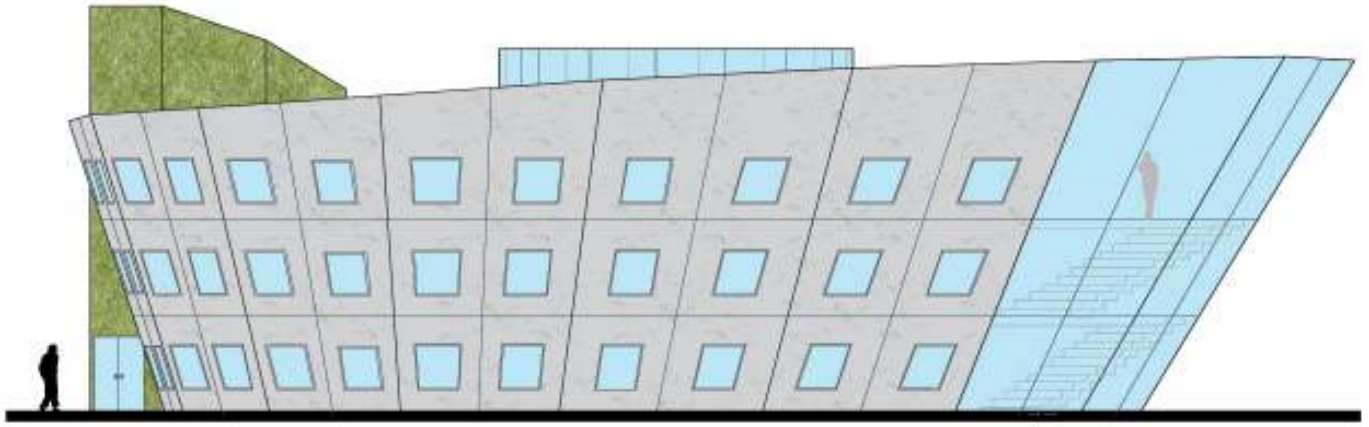
ARCHITECTURE

WATER RINGS

Elevations



East

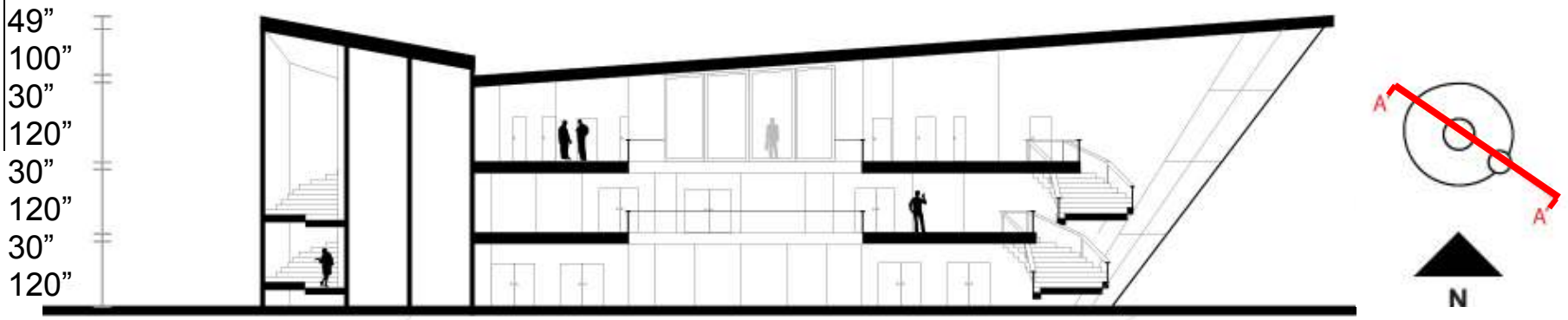


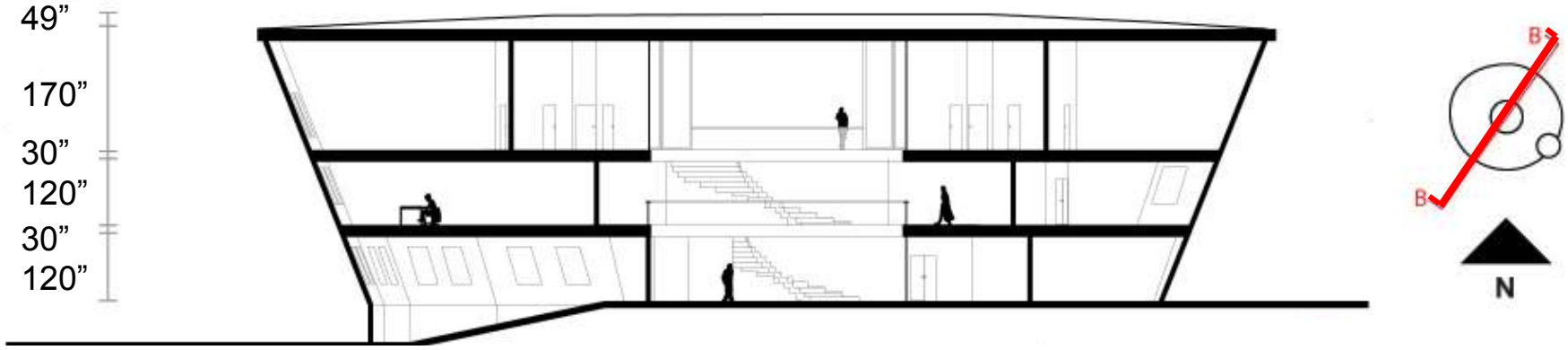
North

ARCHITECTURE

WATER RINGS

Sections

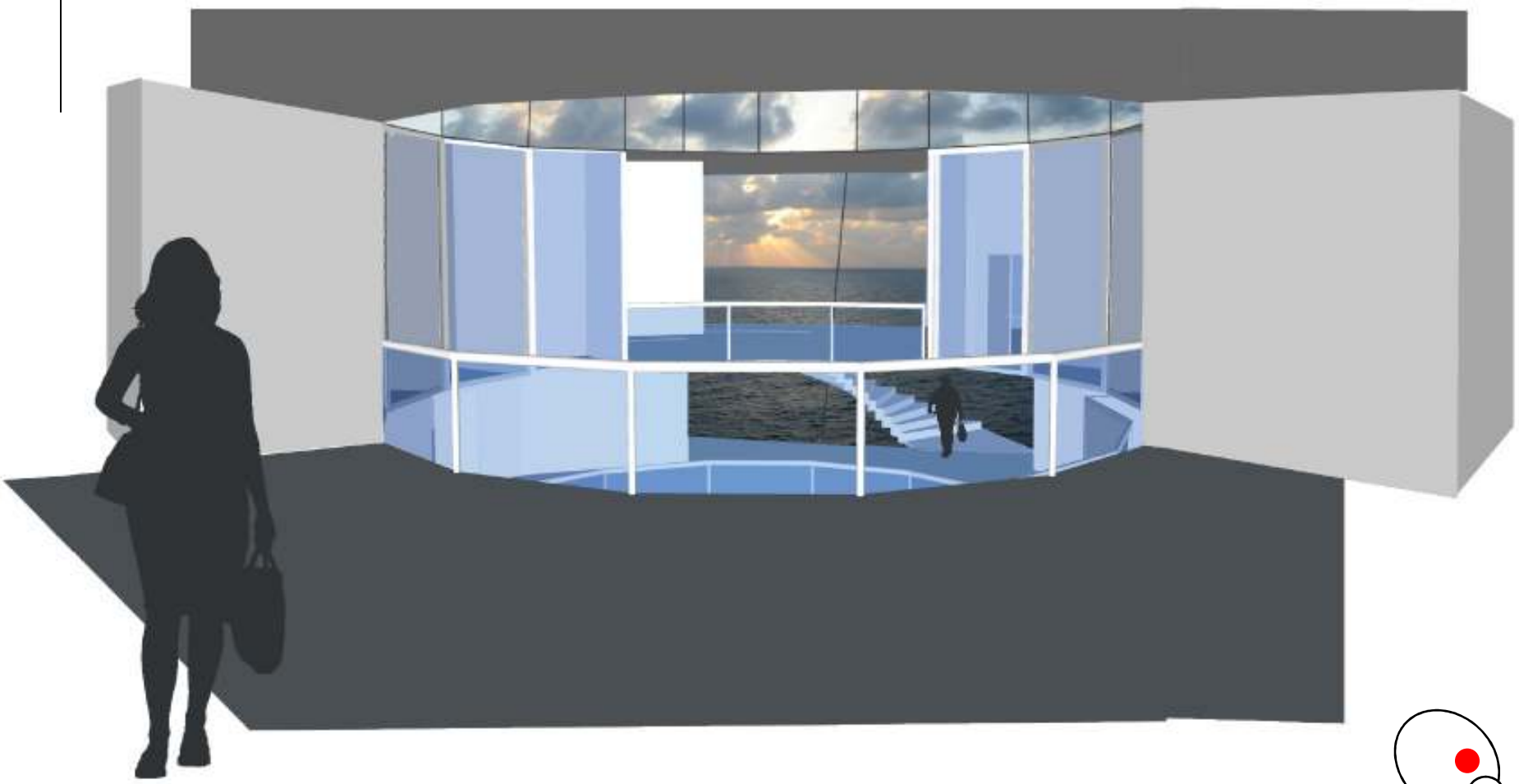




ARCHITECTURE

WATER RINGS

Visual Indoor



ARCHITECTURE

WATER RINGS

Visual Outdoor

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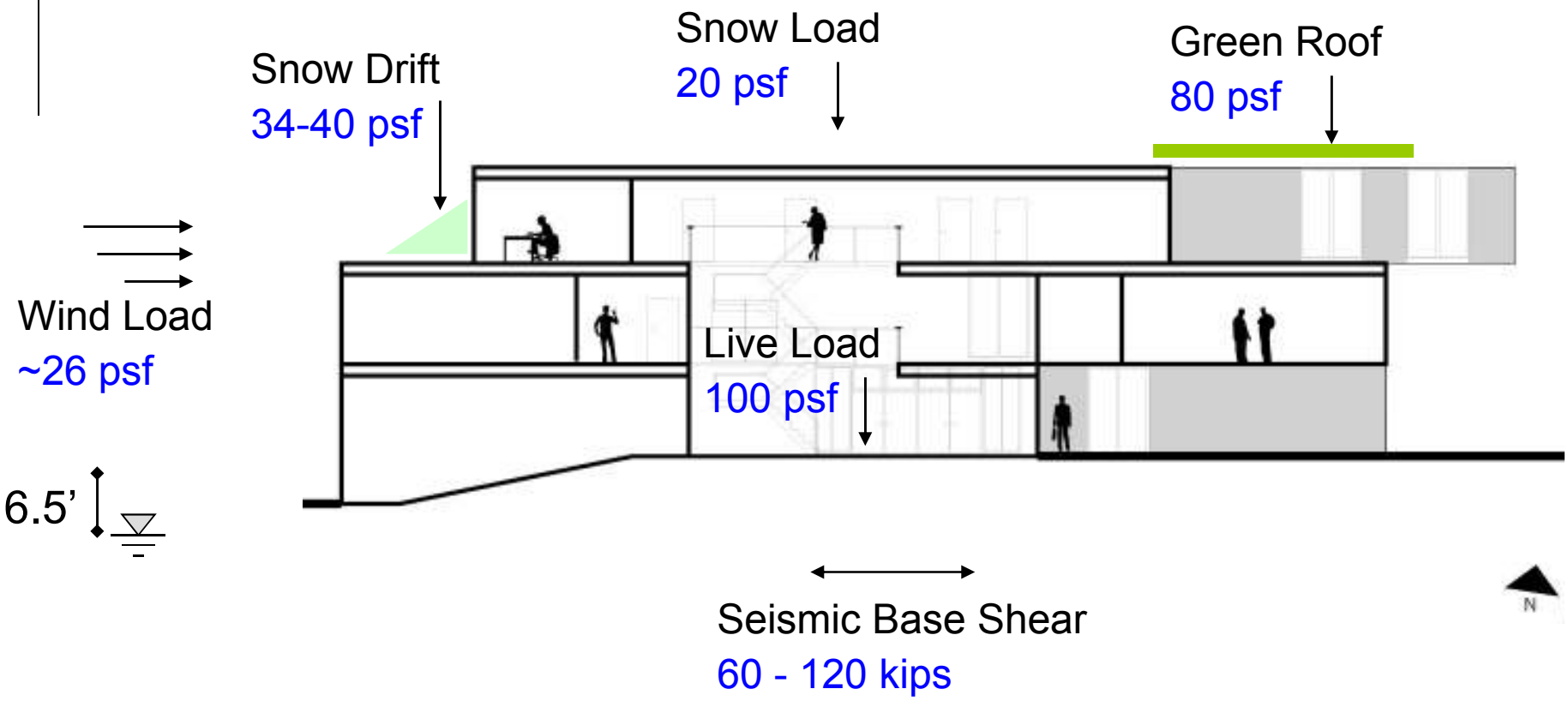
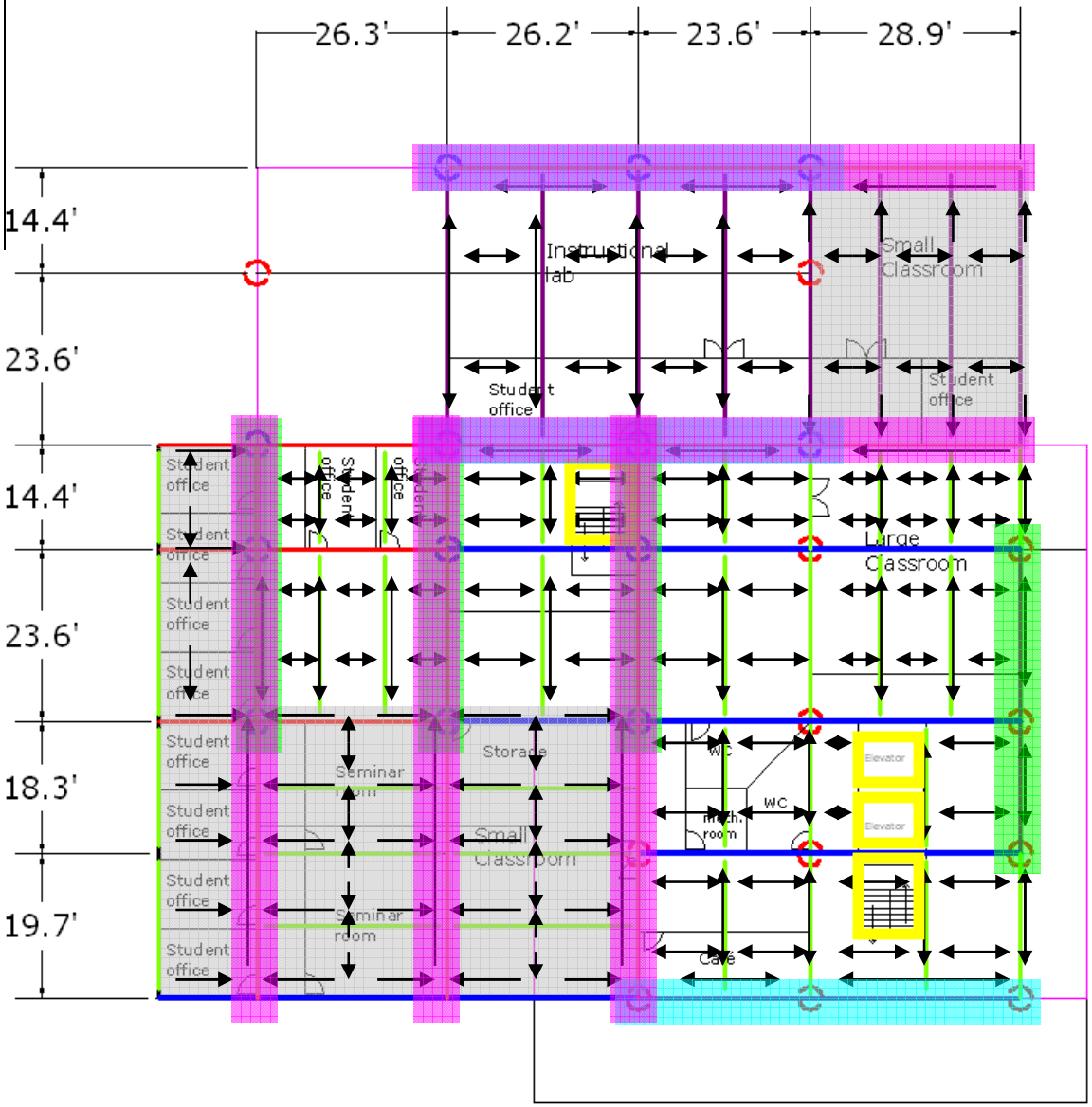
Loads



ENGINEERING

THE LINK

Structural Overlay - 2nd Floor



Columns

Composite Steel

- W14x48
- W21x93

Reinforced Concrete

- 14”x14”
- 28”x28”

Beams/Girders

Composite Steel

- W10x26
- W18x55
- W21x93
- W16x45

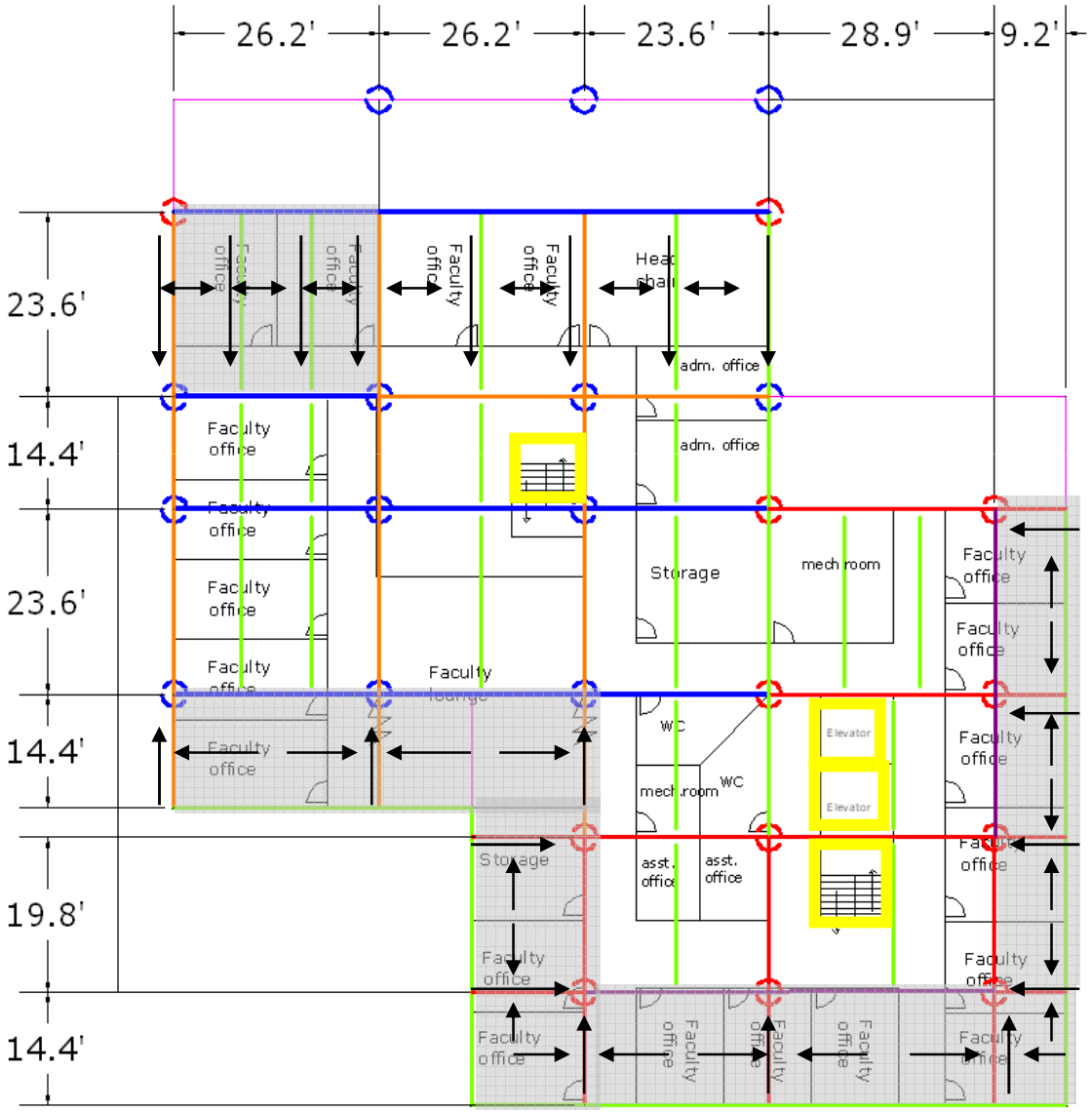
Reinforced Concrete

- 18”x27”
- 20”x30”
- 25”x31”
- 20”x30”

ENGINEERING

THE LINK

Structural Overlay - 3rd Floor



Columns

Composite Steel

- W14x48
- W21x93

Reinforced Concrete

- 14”x14”
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Beams/Girders

Composite Steel

- W10x26
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Reinforced Concrete

- 18”x27”
- 20”x30”
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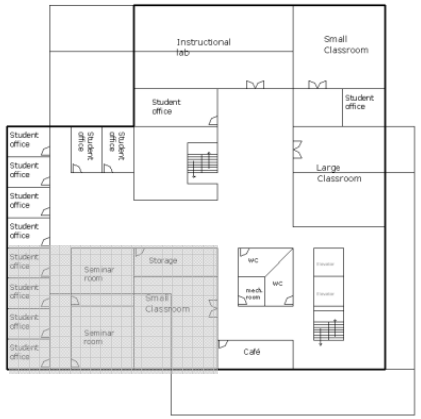
- 20”x30”

ENGINEERING

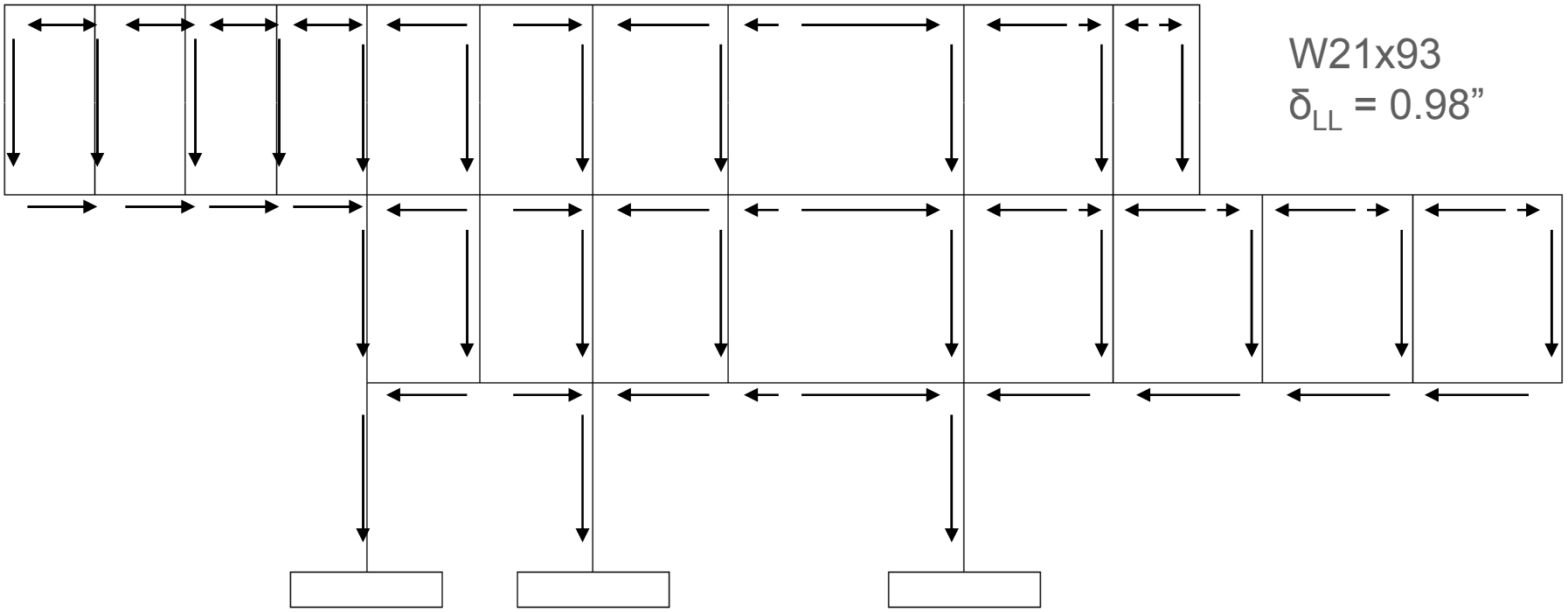
THE LINK

Big Cantilever

2nd Floor



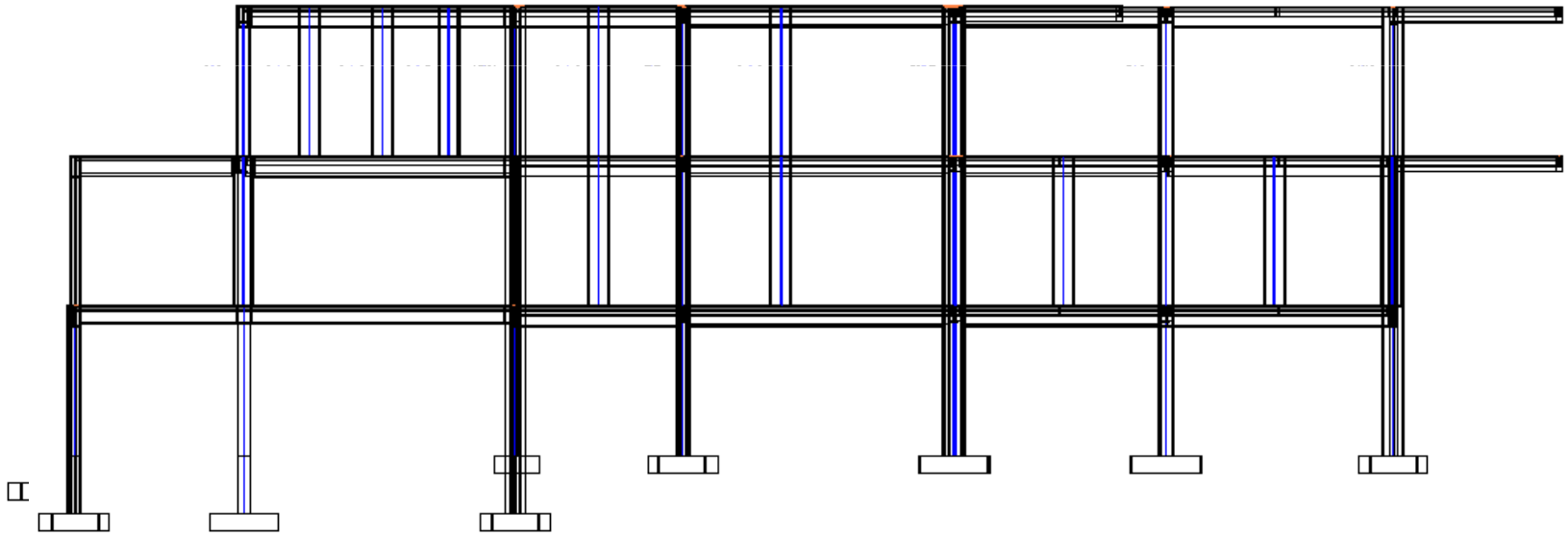
3rd Floor



ENGINEERING

THE LINK

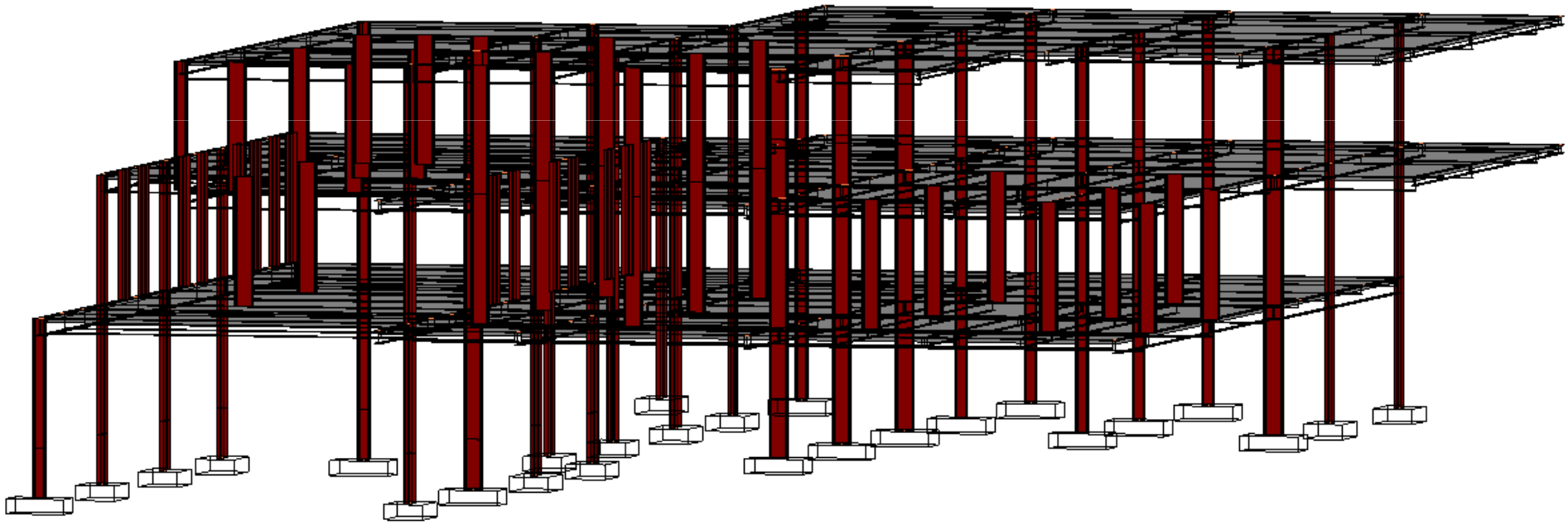
3D Structural Model



ENGINEERING

THE LINK

3D Structural Model



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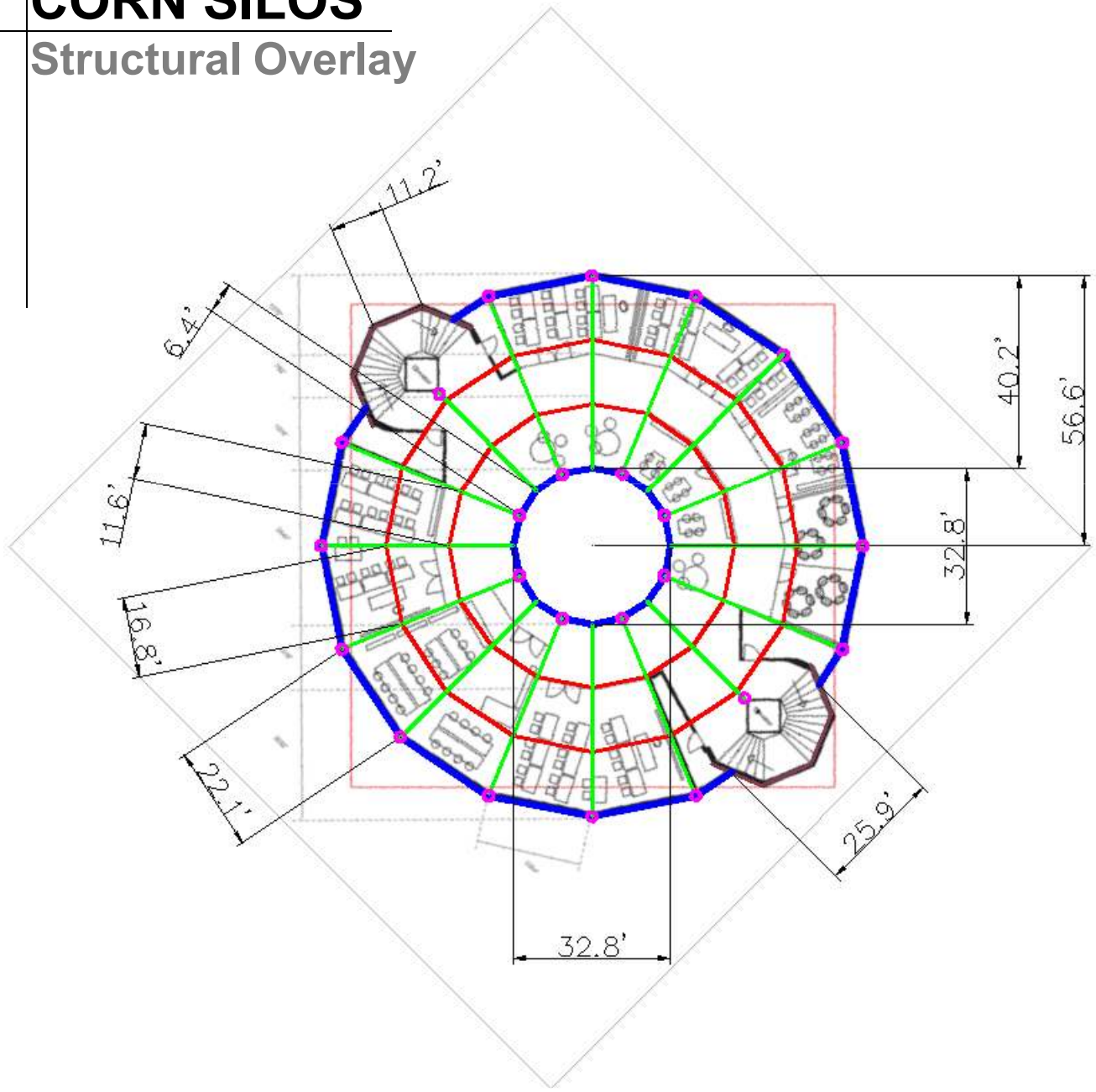
Sustainability Review

Integrated Project Delivery

ENGINEERING

CORN SILOS

Structural Overlay



Columns

12”x12”

Radial Beams

18”x20”

Ext. & Int. Rings

18”x20”

Filler Beams

16”x18”

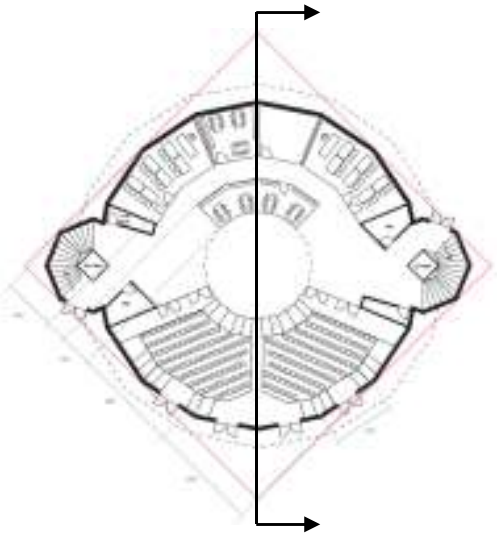
Shear Walls

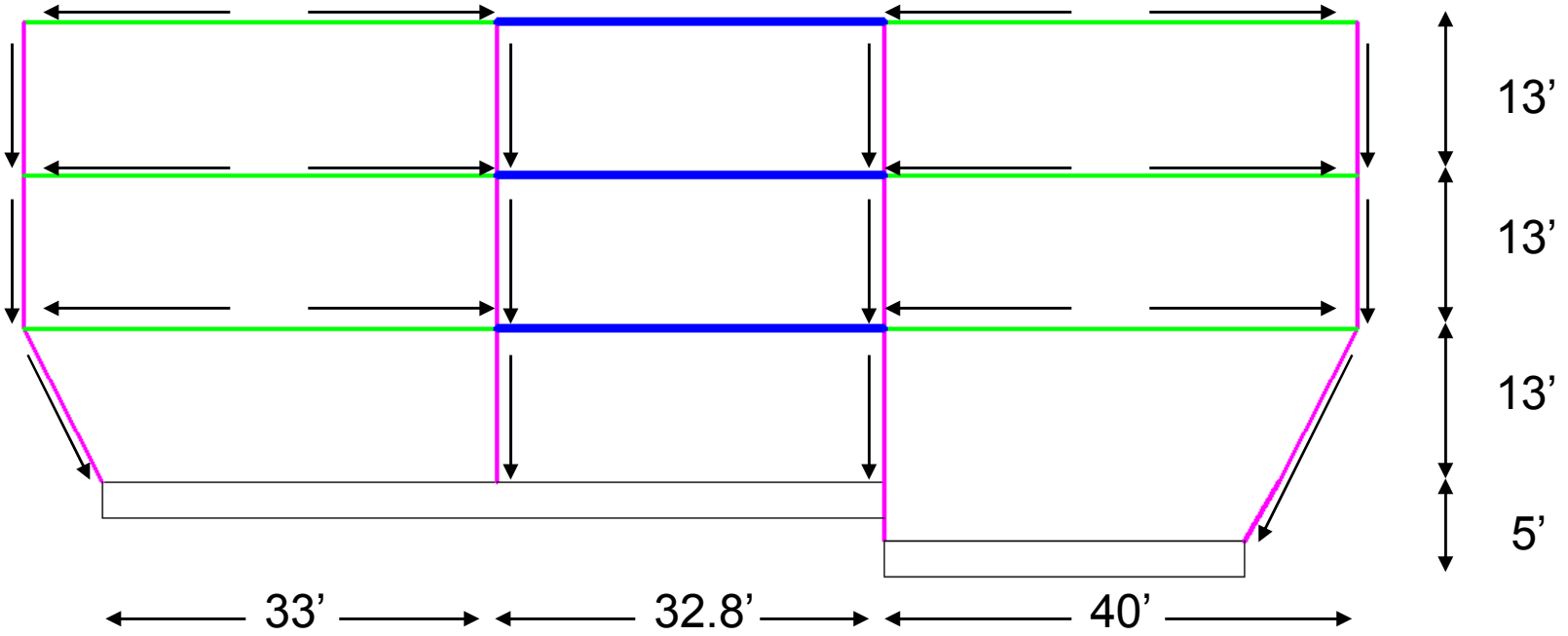
8” thick

ENGINEERING

SILOS

Gravity Load Path

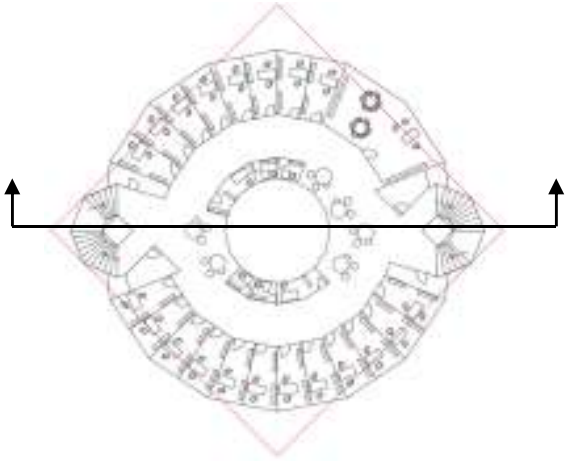


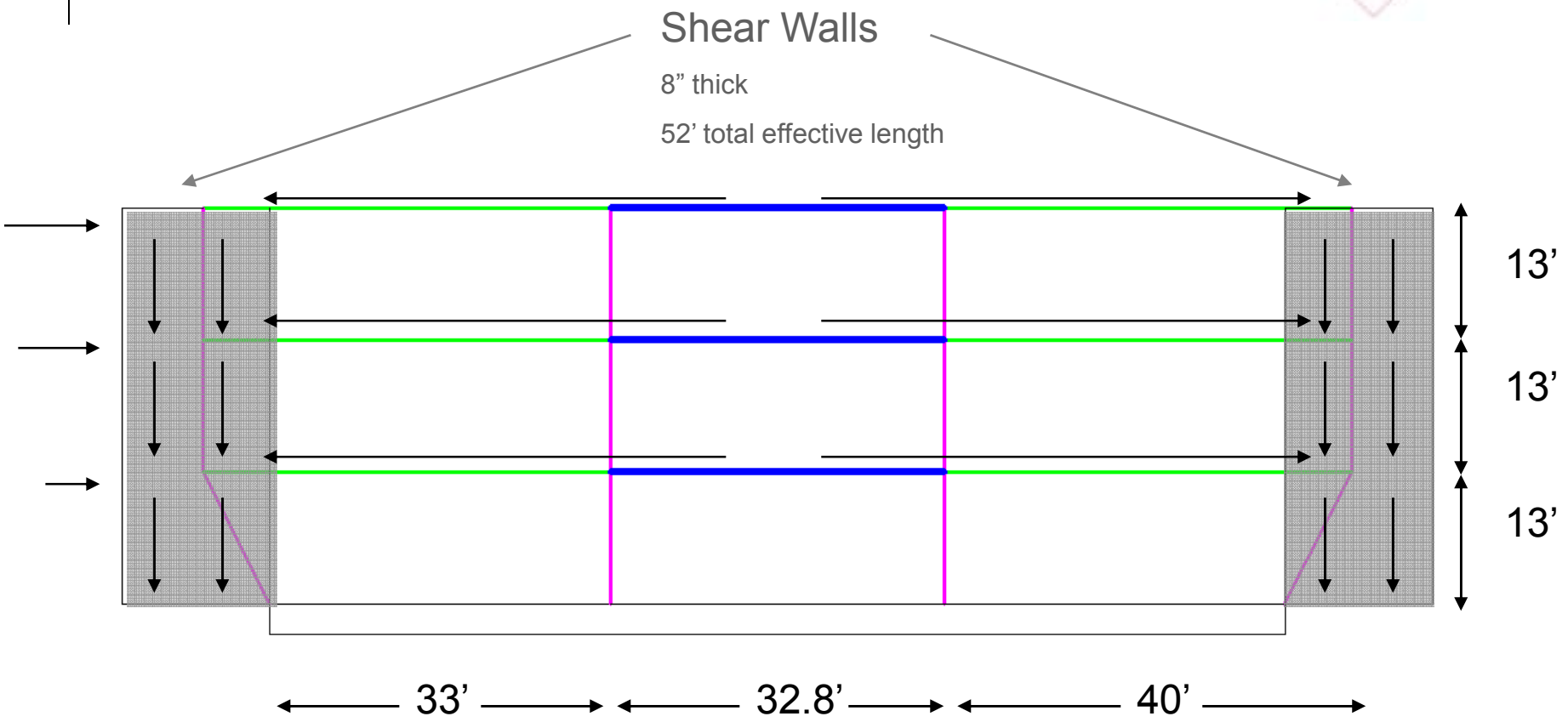


ENGINEERING

SILOS

Lateral Load Path

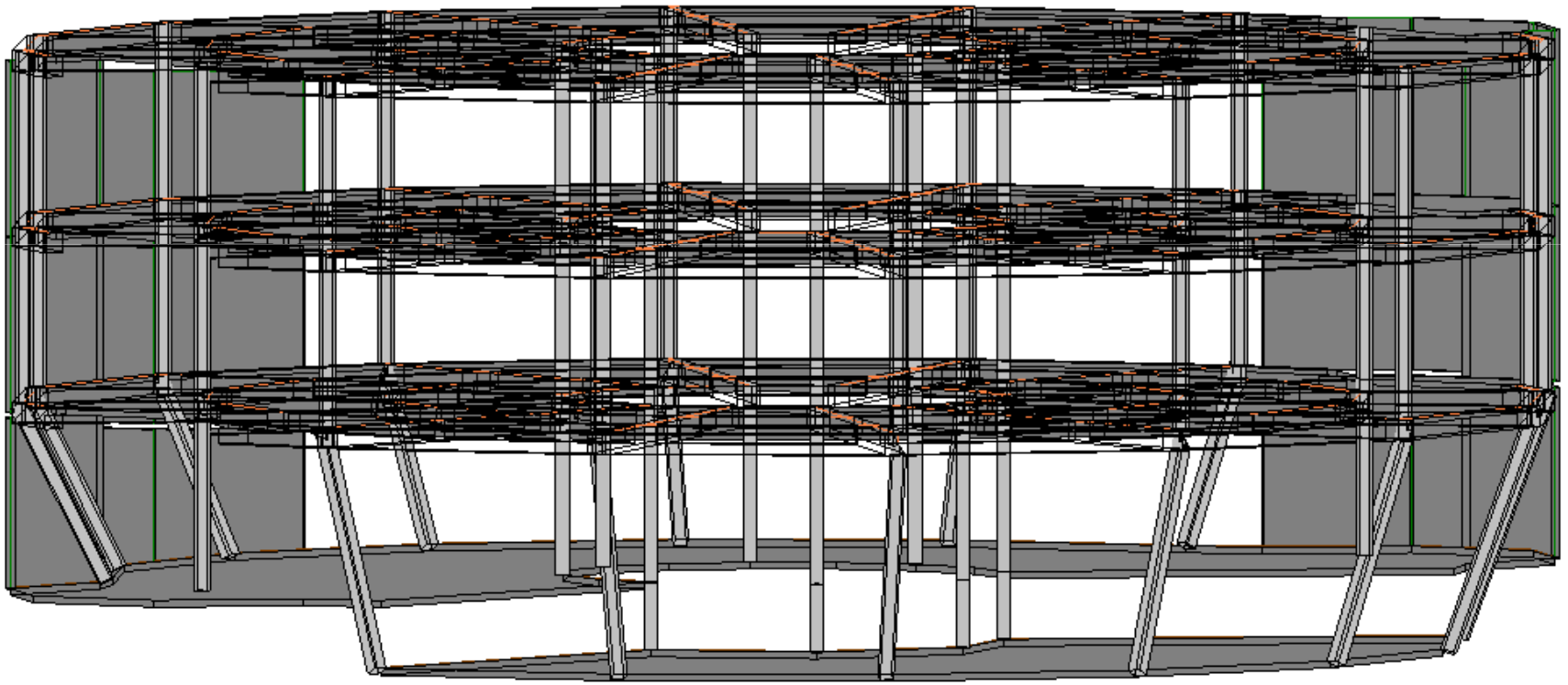




ENGINEERING

SILOS

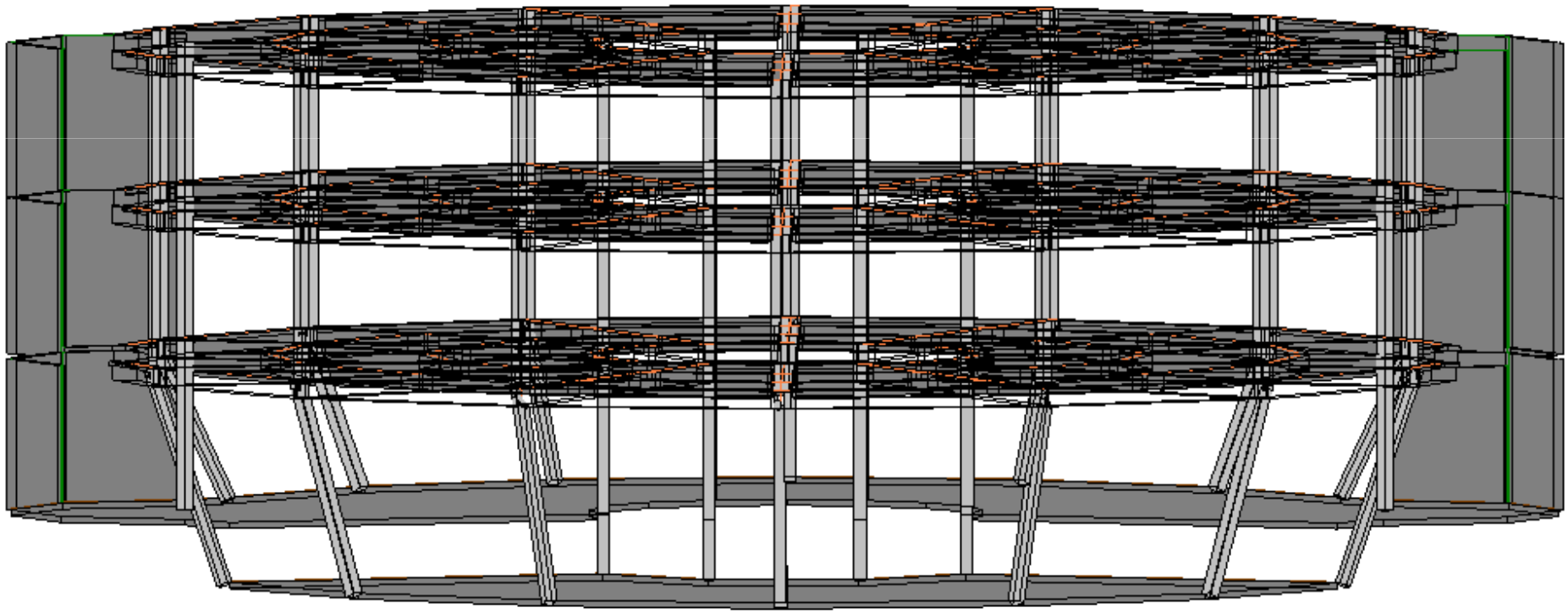
3D Structural Model



ENGINEERING

SILOS

3D Structural Model



ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture

Engineering The Link Corn Silos **Water Rings**

MEP

Construction

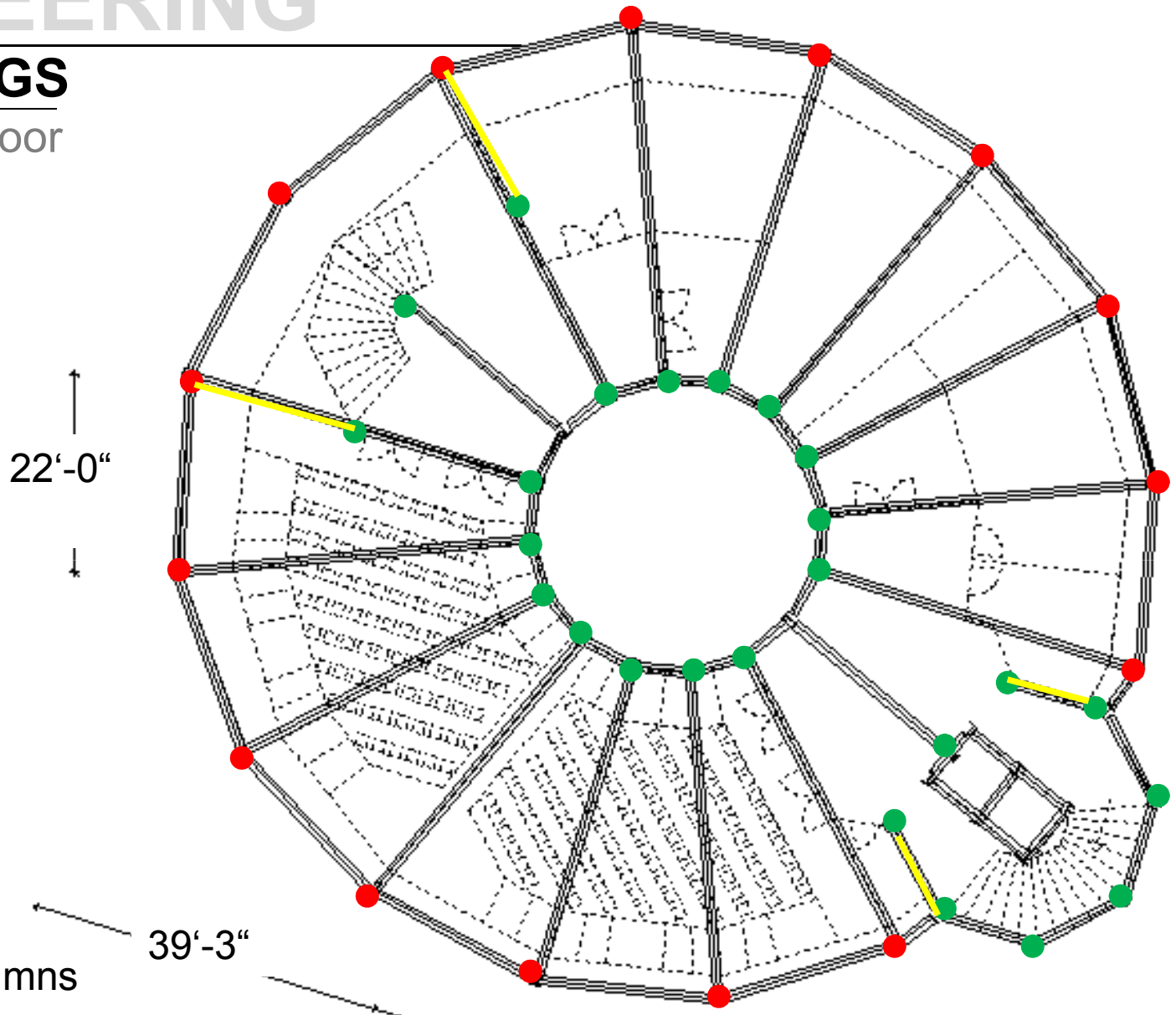
Sustainability Review

Integrated Project Delivery

ENGINEERING

WATER RINGS

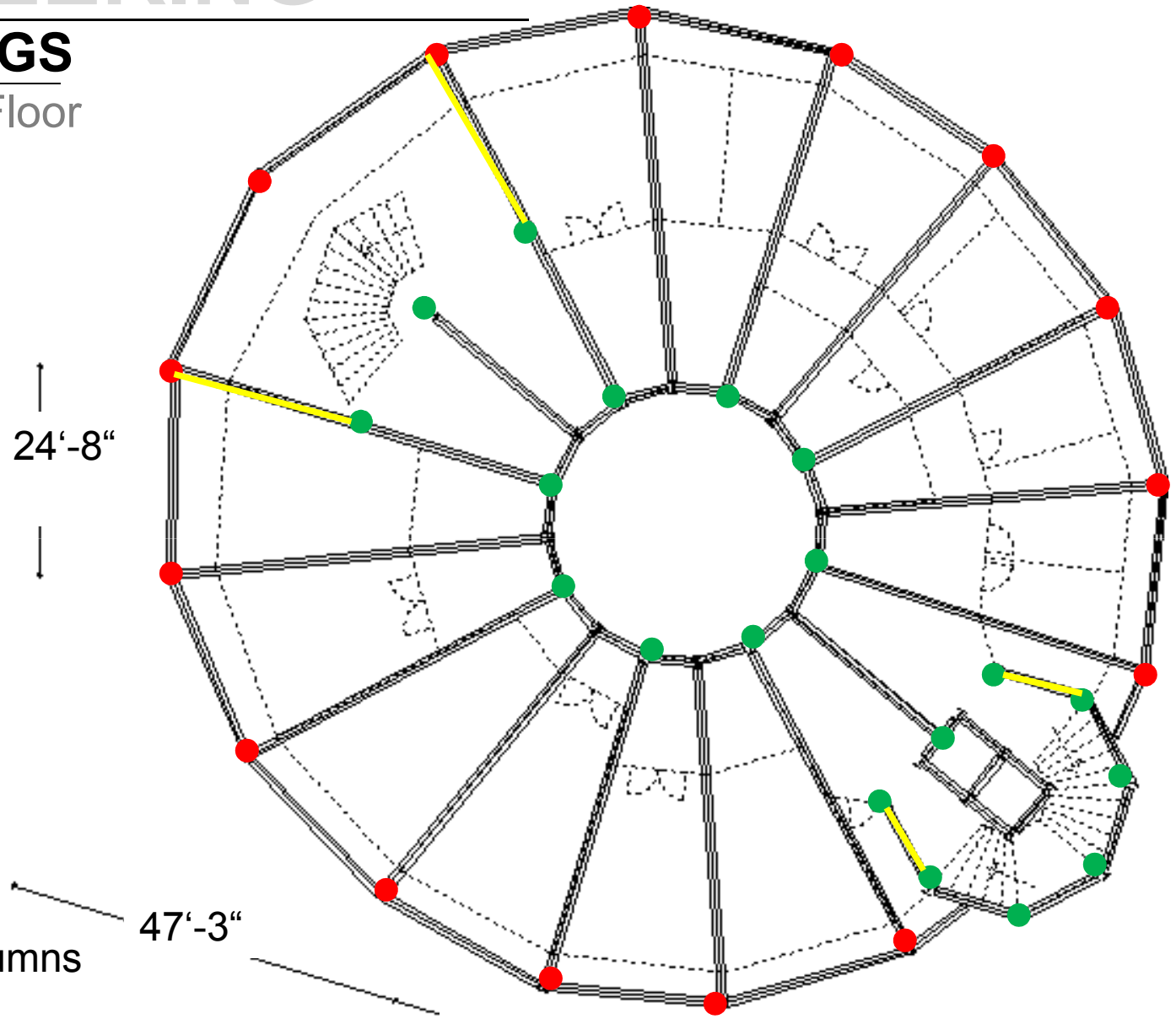
Structure 1st Floor



ENGINEERING

WATER RINGS

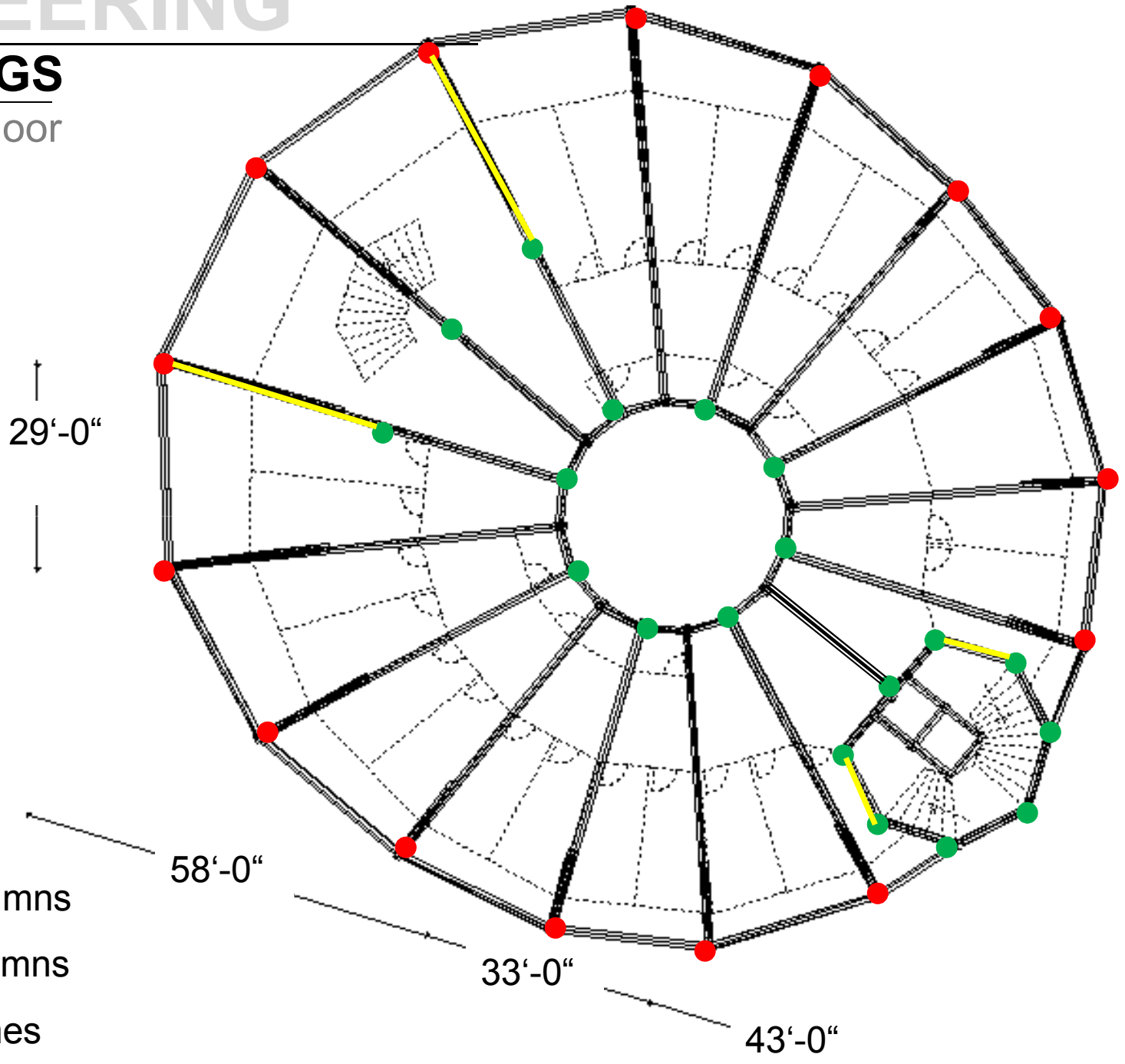
Structure 2nd Floor



ENGINEERING

WATER RINGS

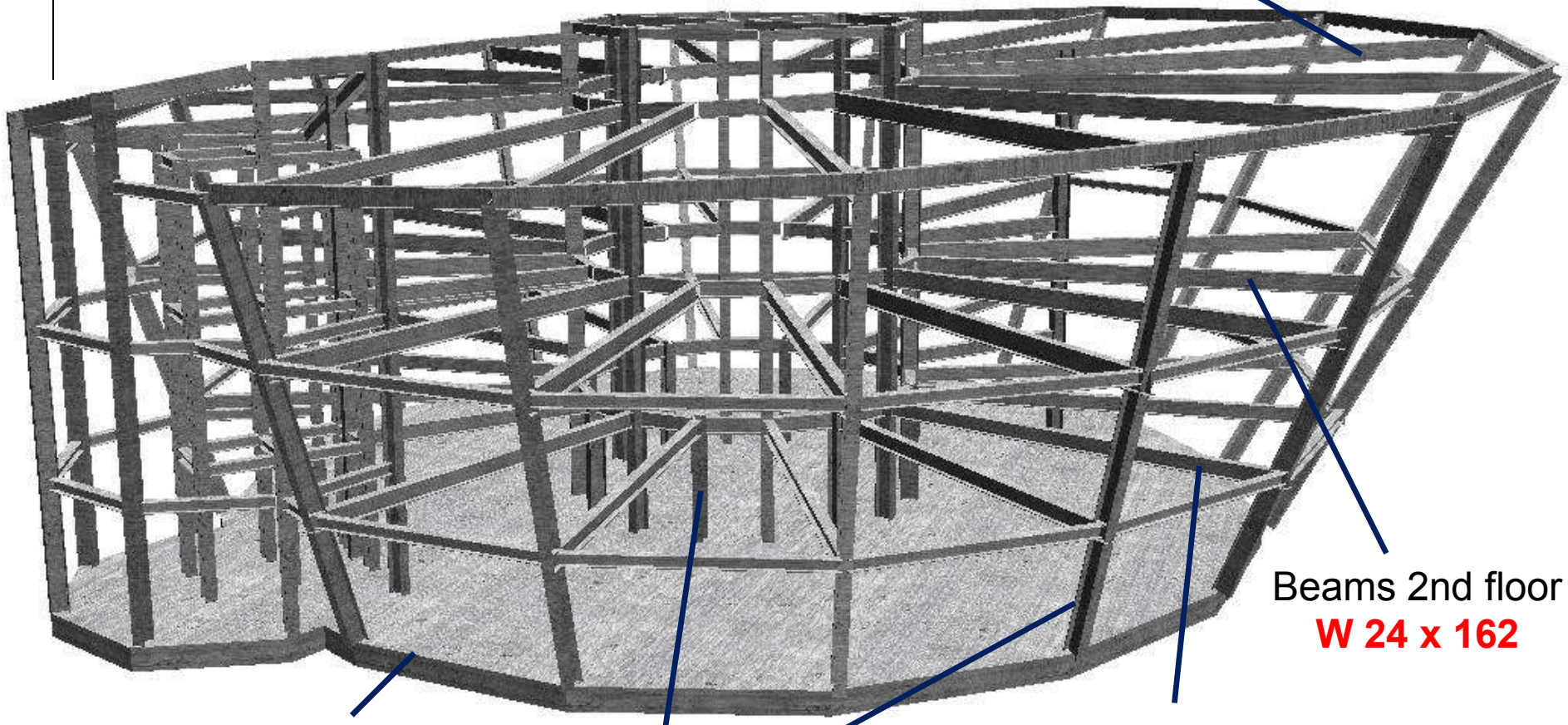
Structure 3rd Floor



ENGINEERING

WATER RINGS

Dimensions

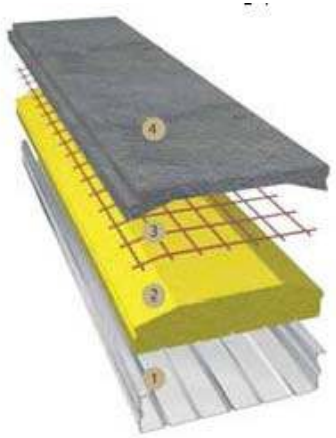


ENGINEERING

WATER RINGS

Slab System

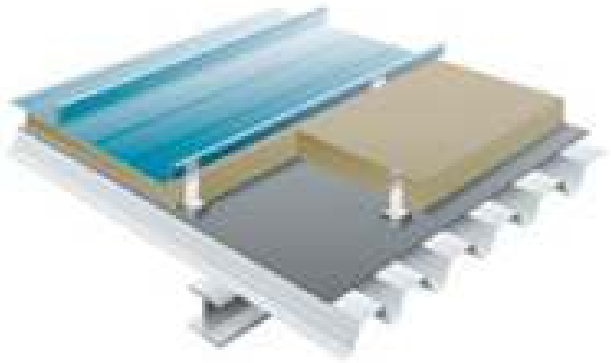
Precast Composite Slab – COFRADAL 200 (Arcelor Construction)



- Spans up to 25‘
- Rapid, Simple Assembly
- All is Prefabricated
- Job Mixed Concrete Only to Grout Joints

1. Steel Profile, 2. Insulation, 3. Steel Mesh, 4. Concrete

trapezoidal profile roof



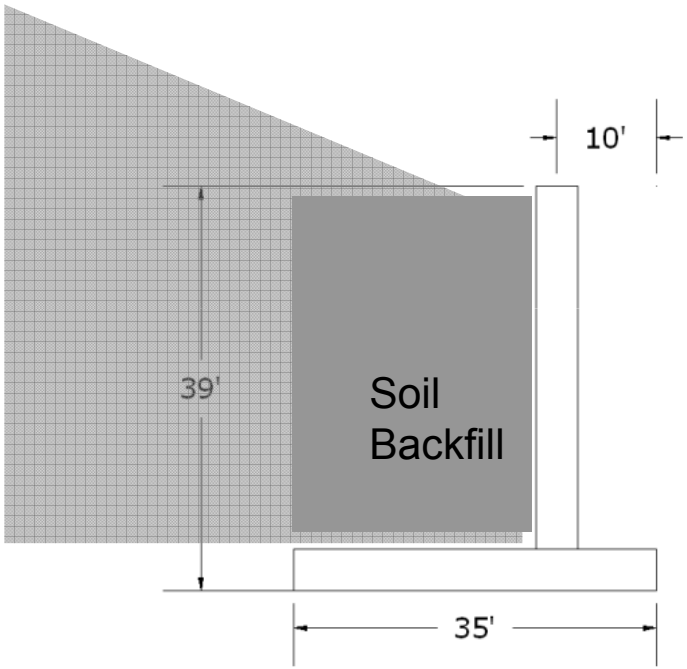
- Spans up to 35‘
- Rapid, Simple Assembly
- Very Low Weight
- Good Thermal Insulation

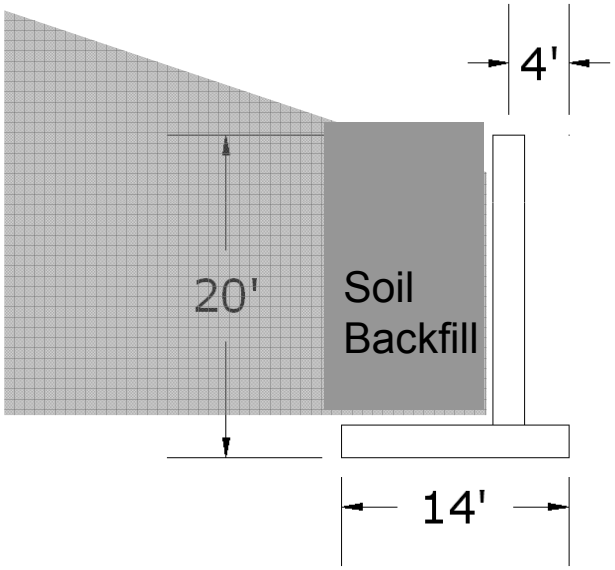
Trapezoidal Profile, Thermal Insulation, Roof Cladding

ENGINEERING

SILOS

Retaining Walls





ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture

Engineering

MEP

Construction

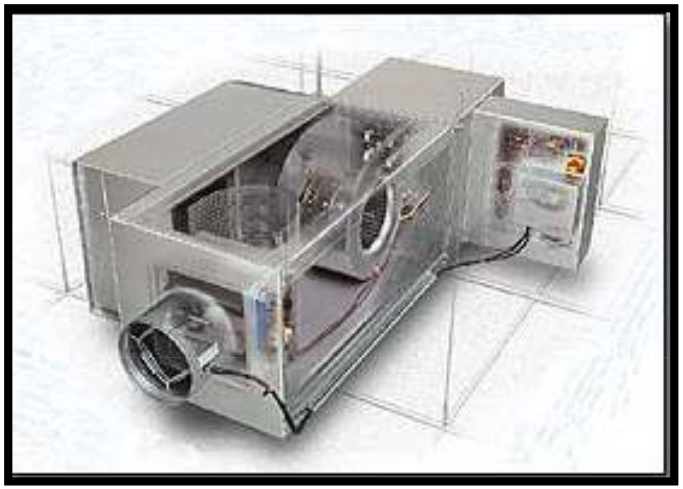
Sustainability Review

Integrated Project Delivery

BOTH CONCEPTS

Control Variable Air Volume System (VAV)

- Controllable room temperature.
- Energy efficient: could be turned off in any room, when not in used.



VAV Box

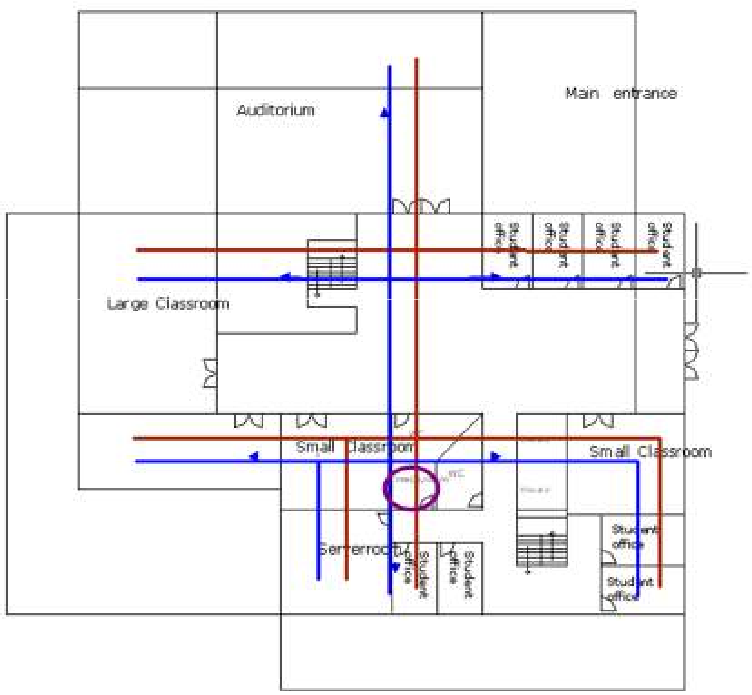
Heating and Cooling Facility

- West Campus Cogeneration Facility.
- University Central Heating and Cooling System.

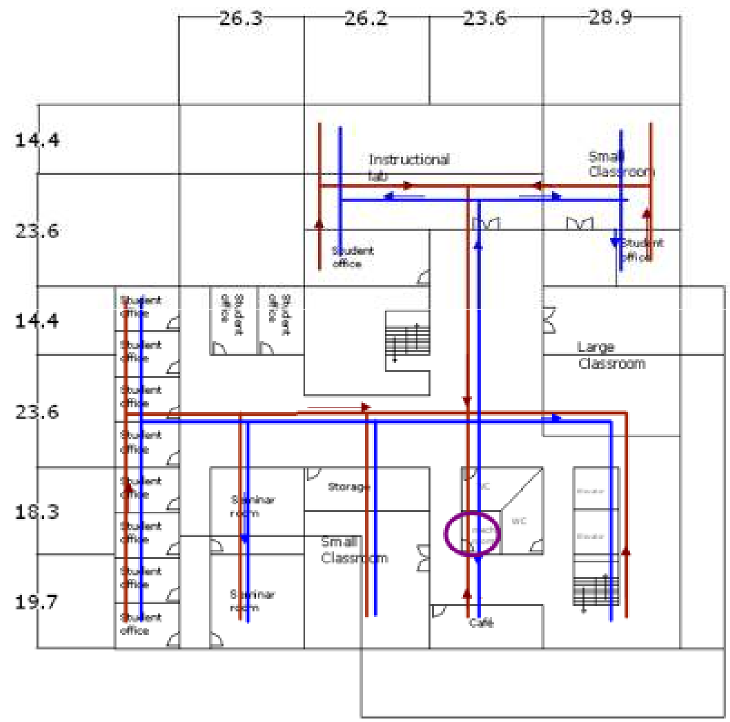
MEP

THE LINK

Duct Distribution



First Floor

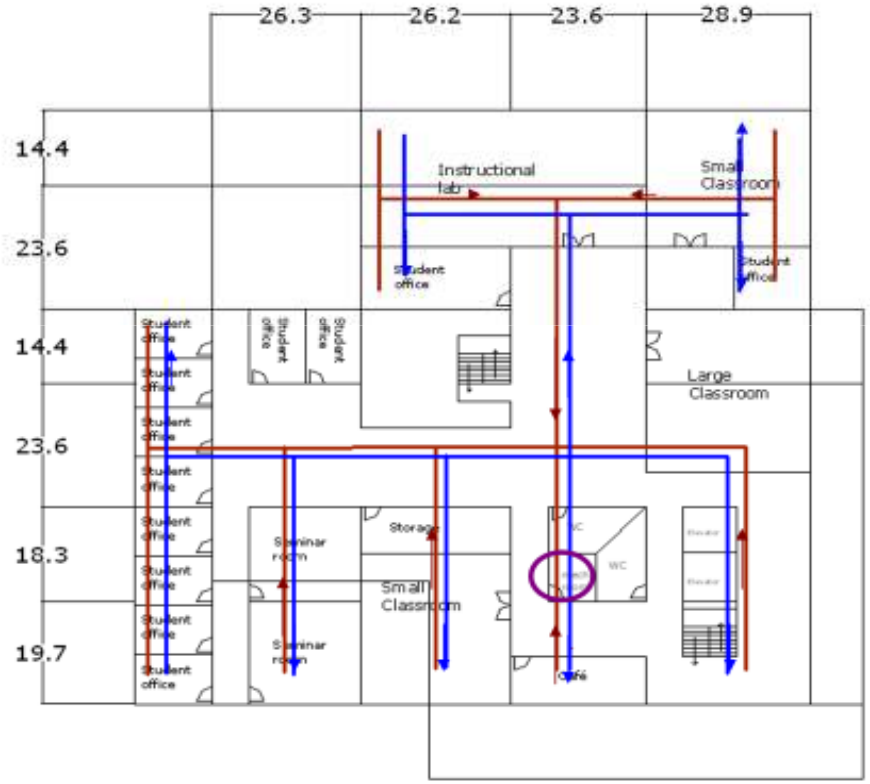


Second Floor

MEP

THE LINK

Duct Distribution

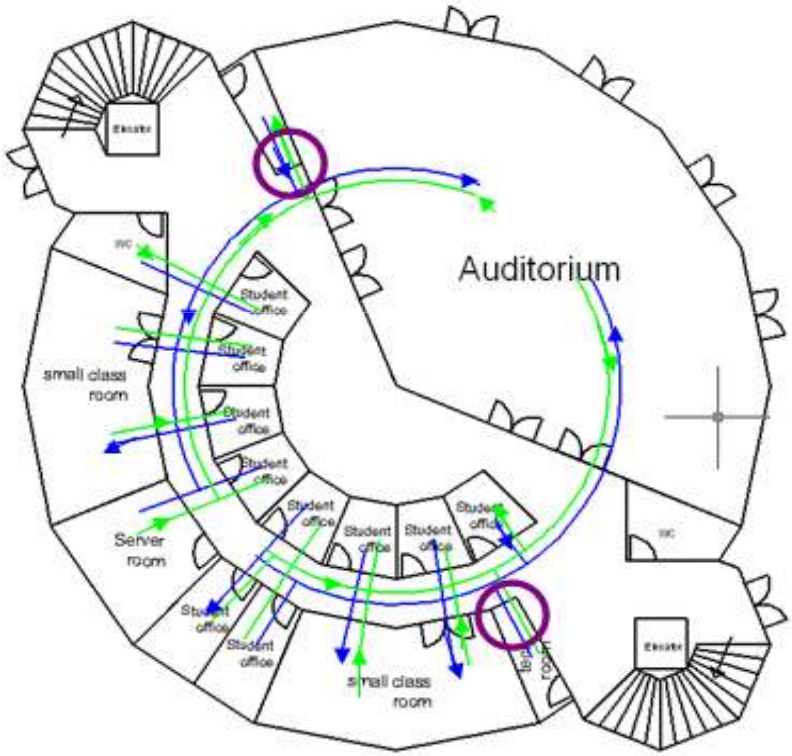


Third Floor

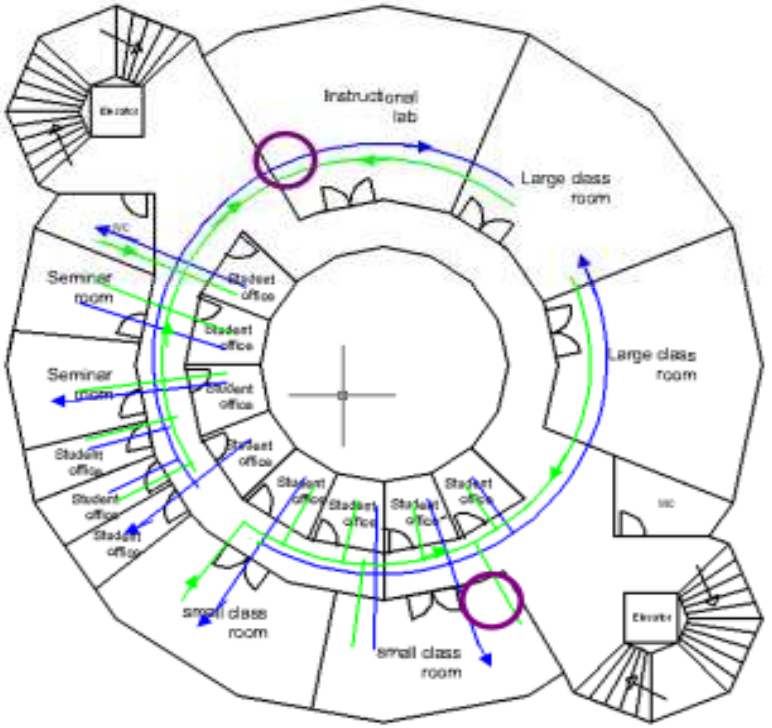
MEP

CORN SILOS & WATER RINGS

Duct Distribution



First Floor

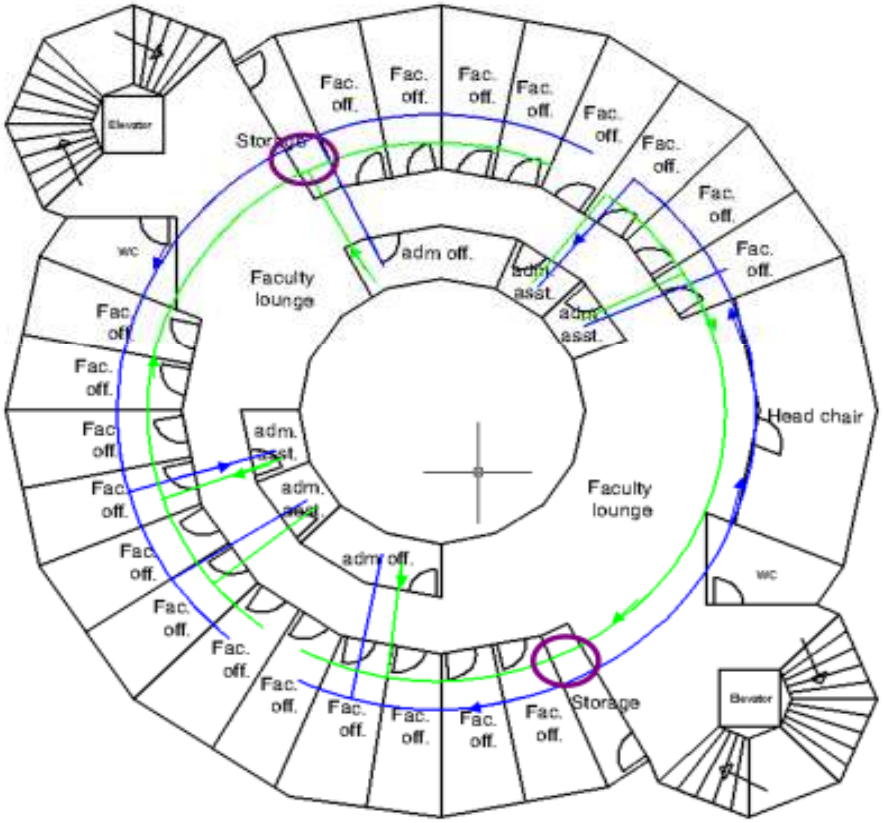


Second Floor

MEP

CORN SILOS & WATER RINGS

Duct Distribution

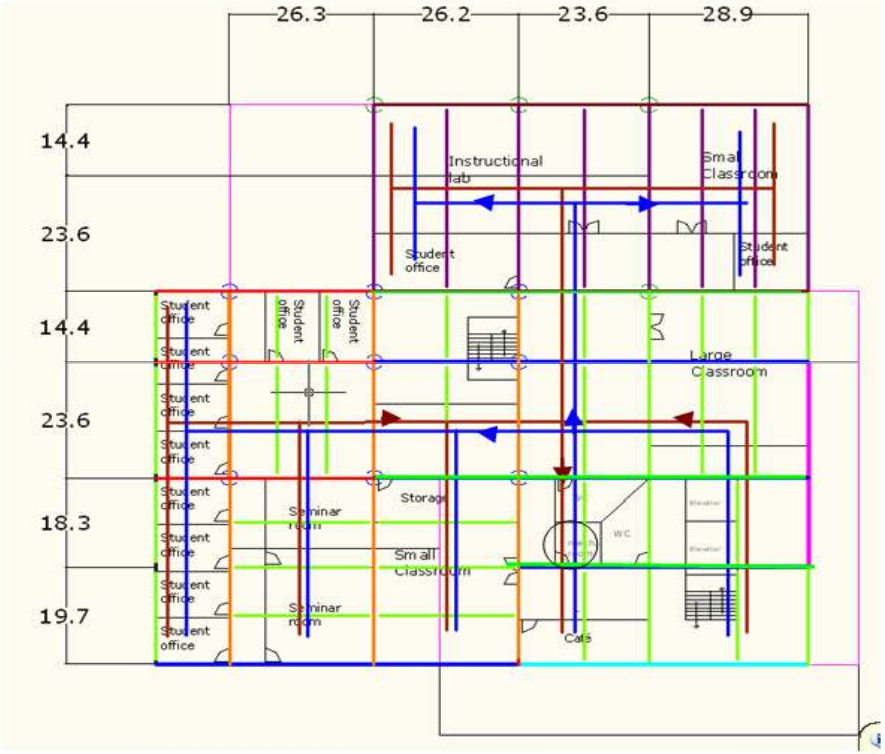


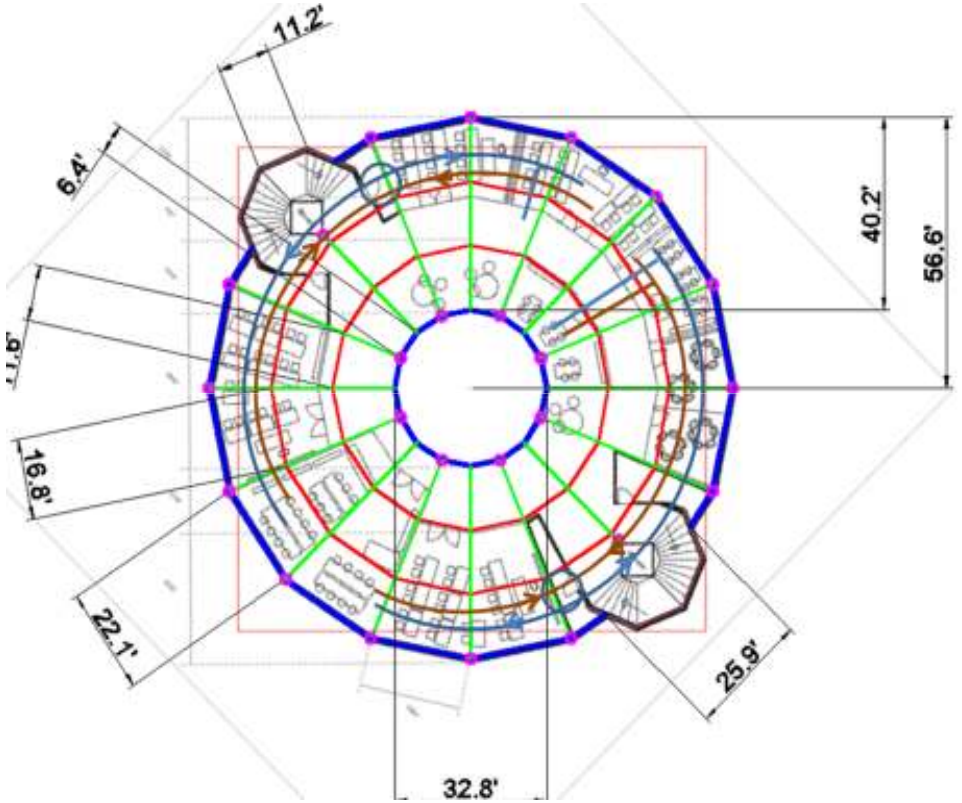
Third Floor

MEP

THE LINK, CORN SILOS & WATER RINGS

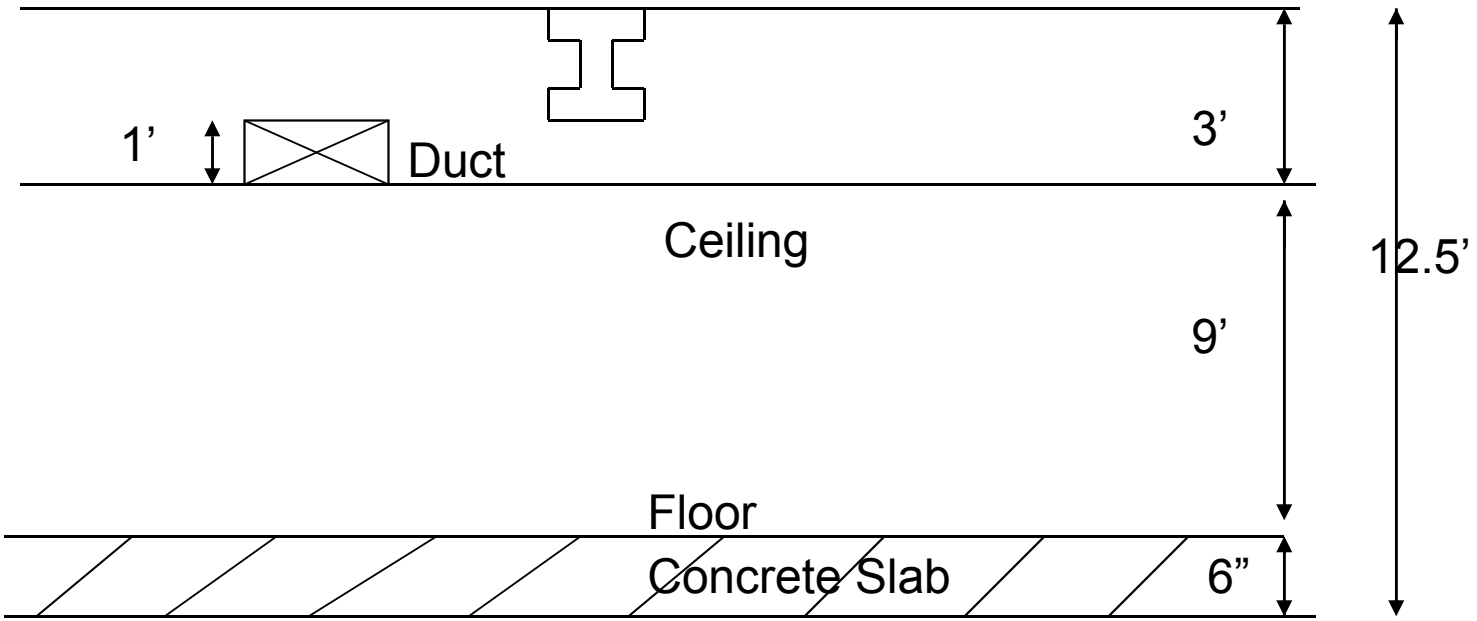
Duct Distribution in Structural Plan





THE LINK, CORN SILOS & WATER RINGS

Floor Section



ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture

Engineering

MEP

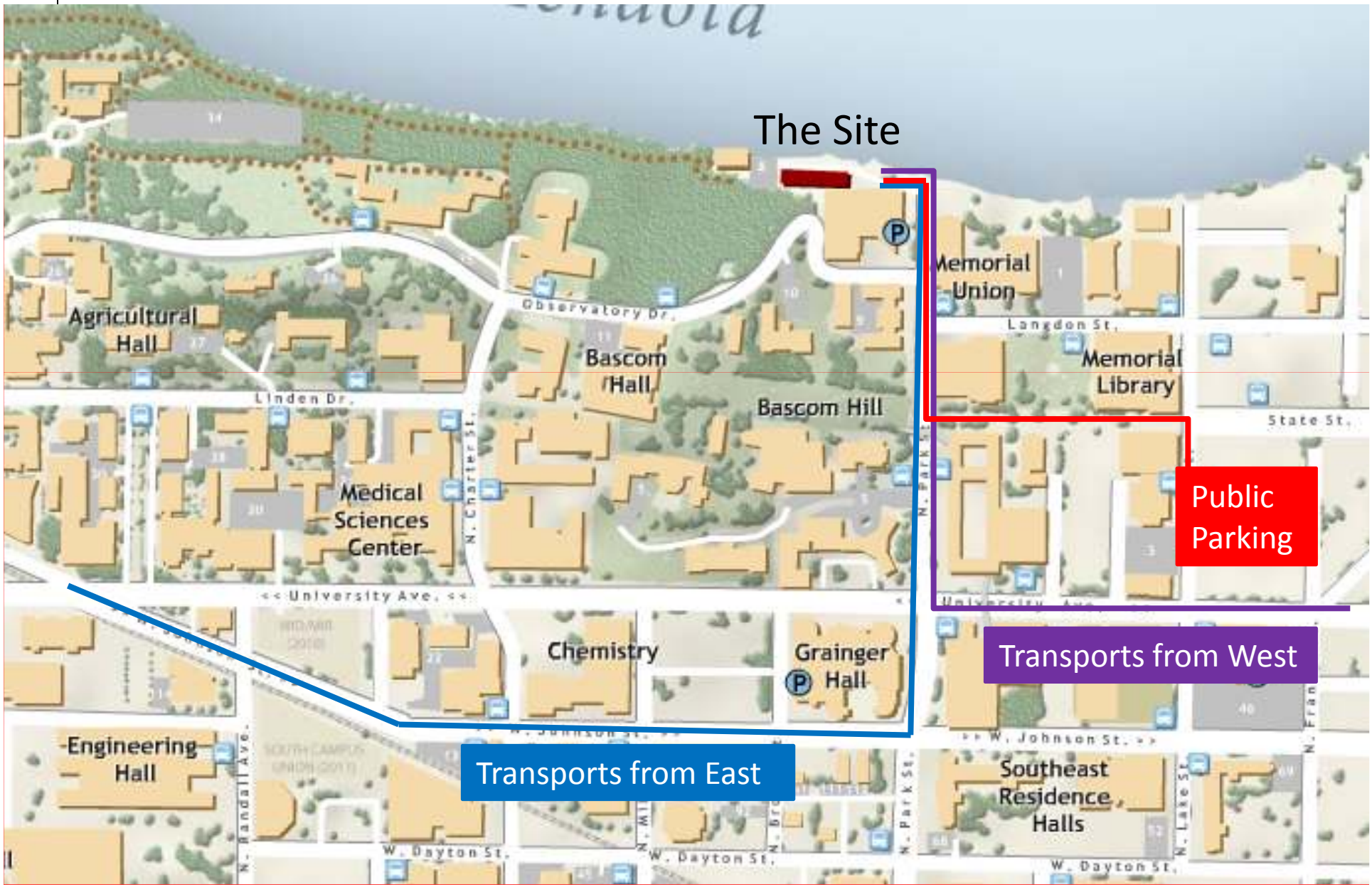
Construction

Sustainability Review

Integrated Project Delivery

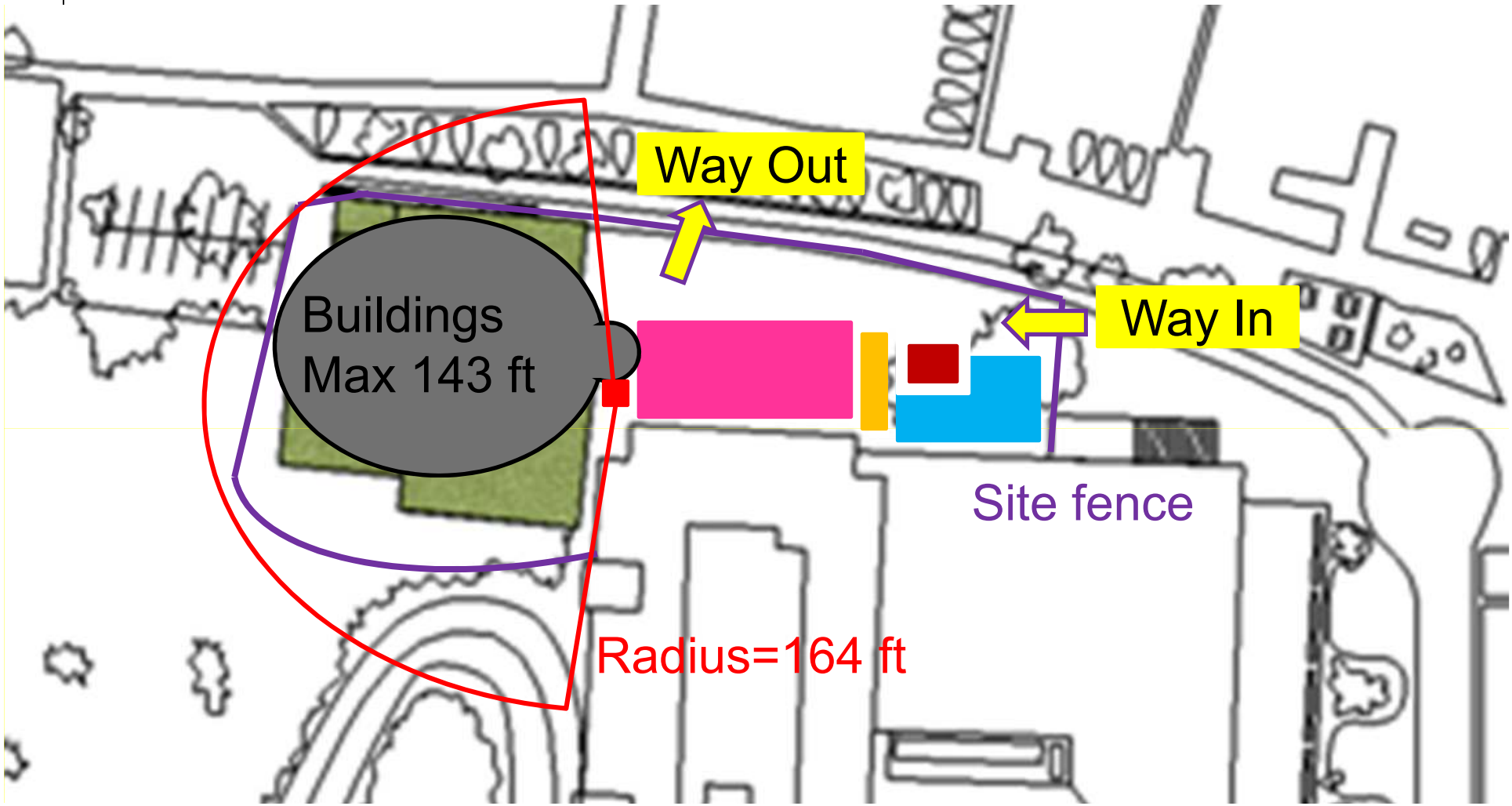
CONSTRUCTION

TRANSPORTATION ACCESS & EMPLOYEE PARKING



CONSTRUCTION

SITE LOGISTICS



Crane 14x14 ft

Material Storage 91x42 ft

Recycling Containers 41x15 ft

Containers 23x18 ft

2 Decks Site Office, Safety etc. 1522 sq.ft.

CONSTRUCTION

CRANE SELECTION

71 EC-B 6 Standard DIN/FEM	
Max Hook Height	136 ft (41.5 m)
Max Lifting Capacity	11,000 lb (5,000 kg)
Max Radius	164 ft (50 m)
Lifting Capacity @ Max Radius	2,204 lb (1,000 kg)

CONSTRUCTION

EQUIPMENT

Front-End Loader

Excavator

Dump Truck

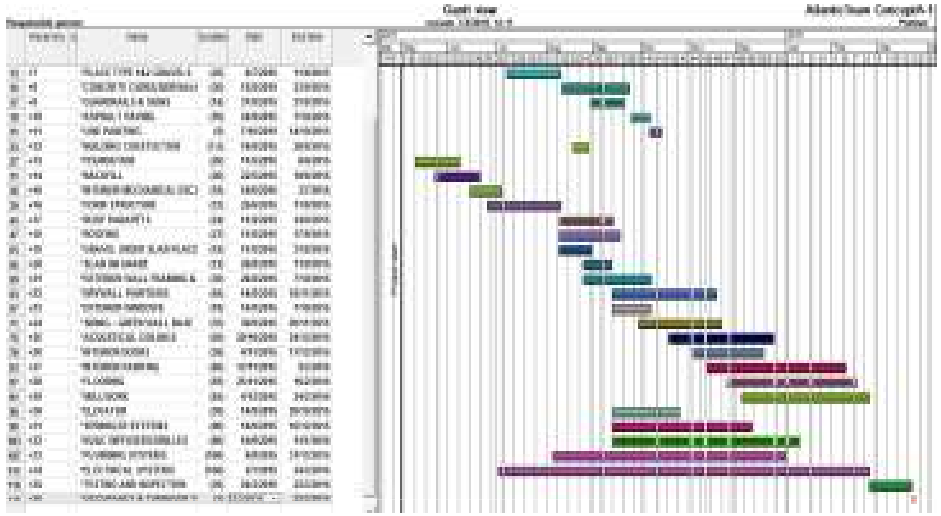
Tree Remover

Concrete Pump Truck

Truck Flatbed

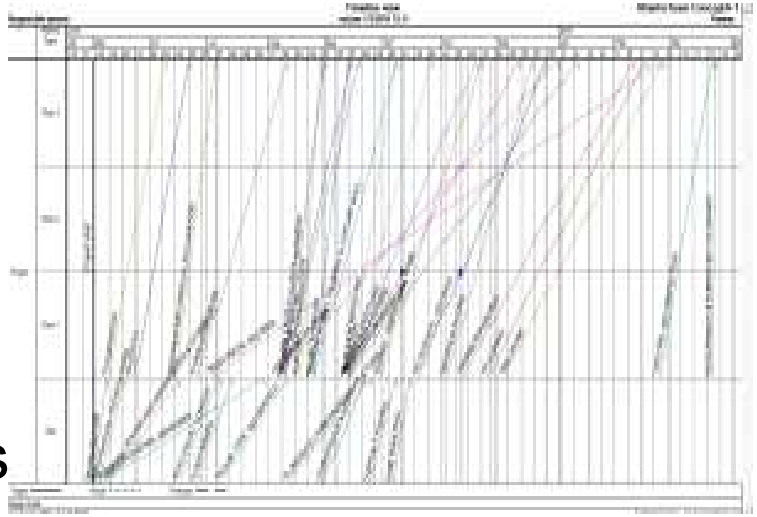
CONSTRUCTION

SCHEDULES



Gantt Chart and Location Based

Negotiated with Owner
Early Start – May 1st

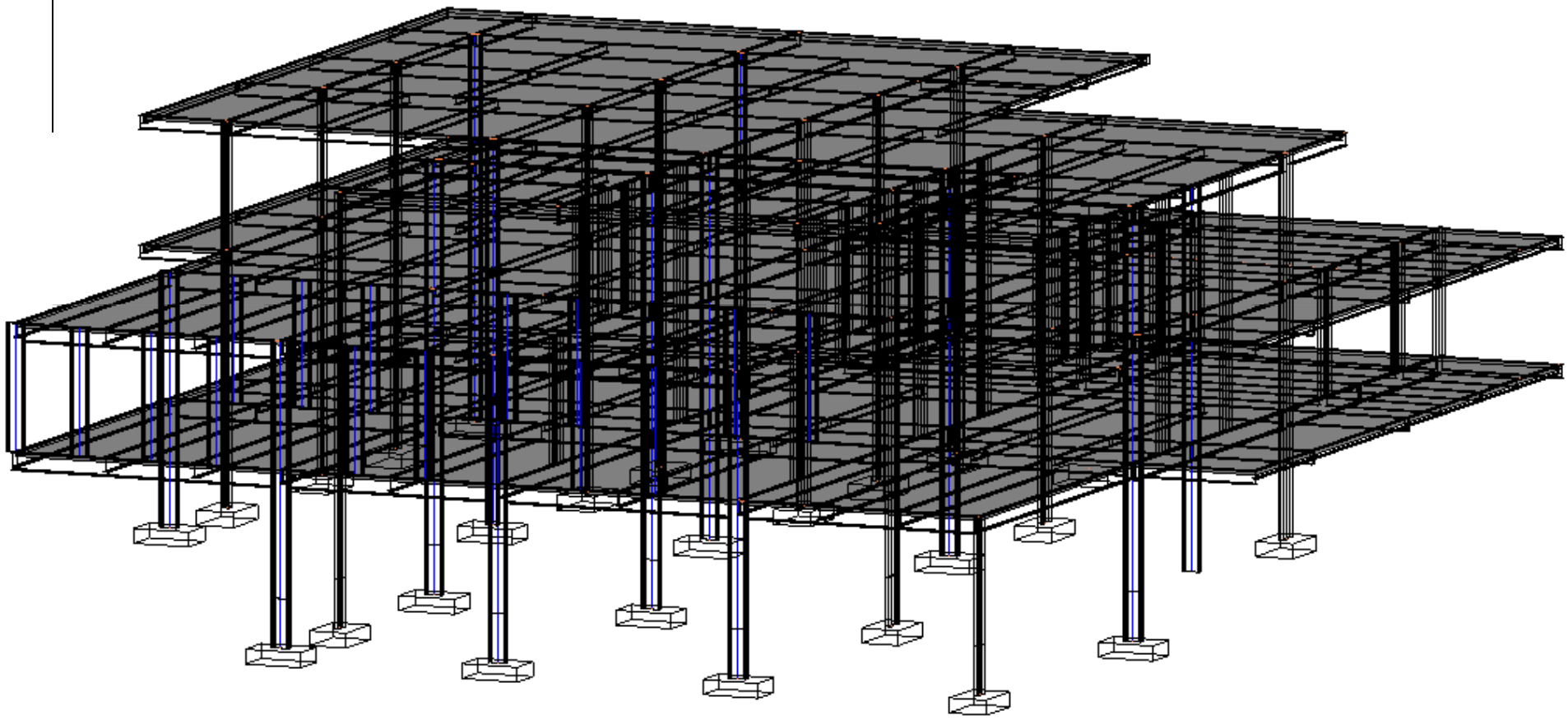


Summary of Four Alternatives

- ❑The Link (Steel) – 10.5 months
- ❑The Link (Concrete) – 12 months
- ❑Silos (Concrete) – 11 months
- ❑Water Rings (Concrete) – 11 months

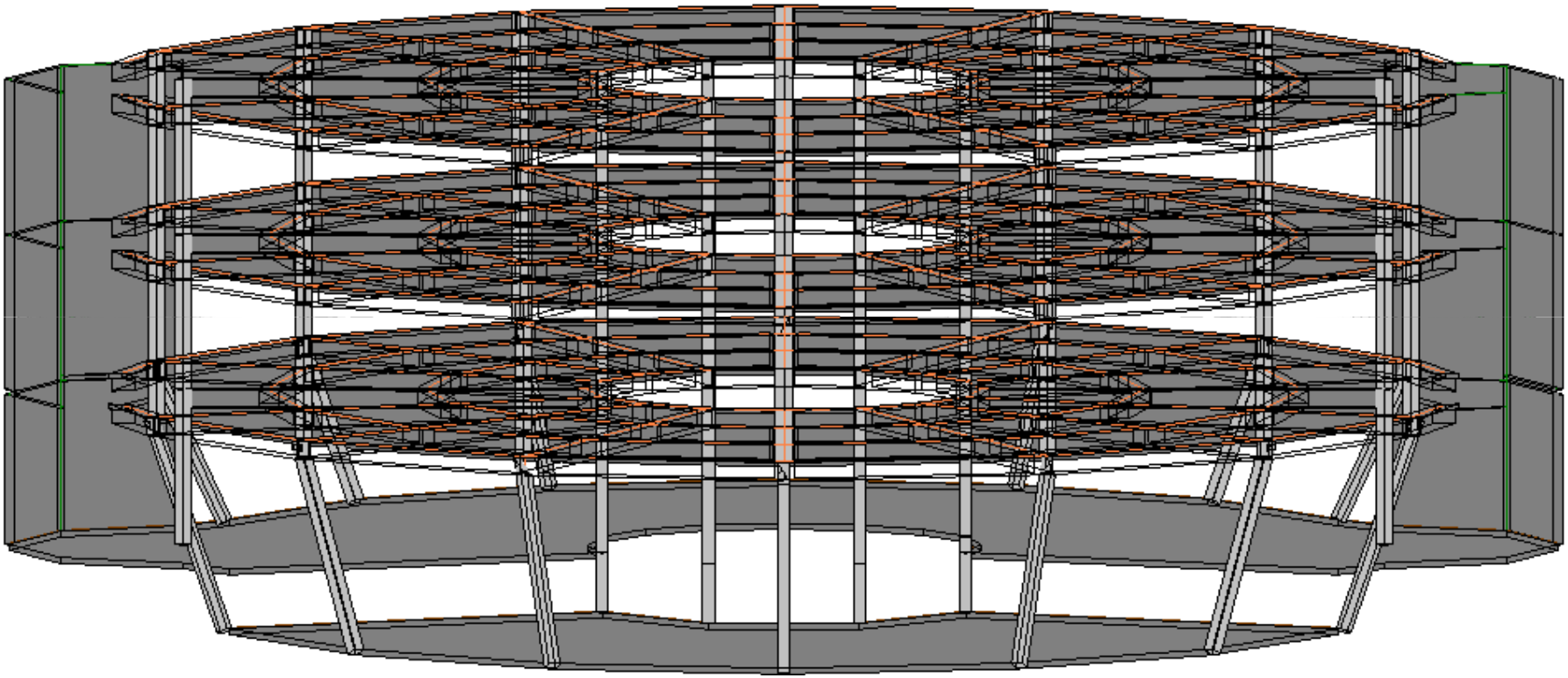
CONSTRUCTION

ERECTION SEQUENCE – THE LINK (STEEL)



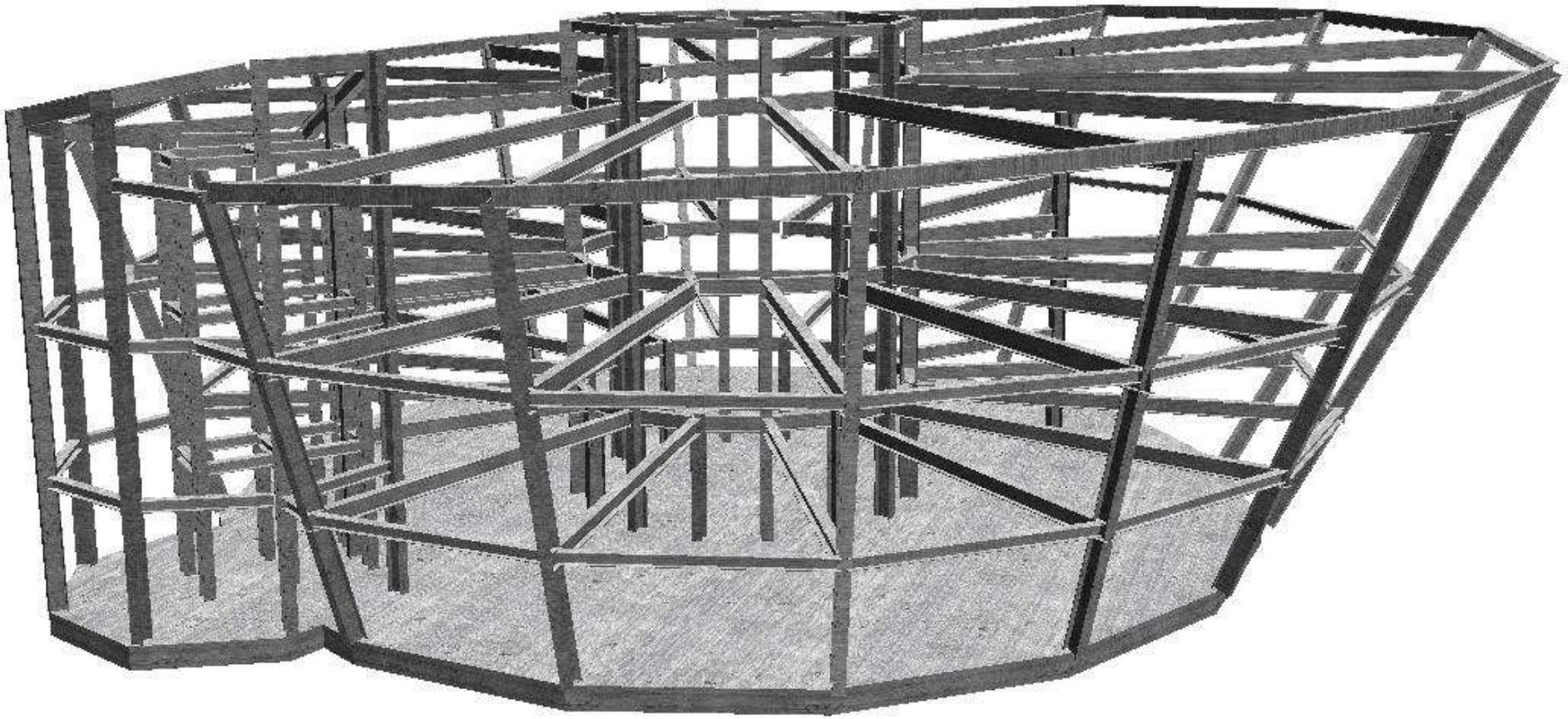
CONSTRUCTION

ERECTION SEQUENCE – CORN SILOS (CONCRETE)

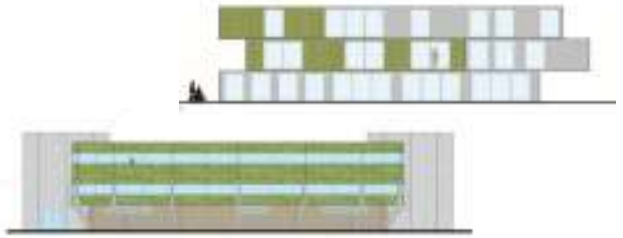


CONSTRUCTION

ERECTION SEQUENCE – WATER RINGS - STEEL



CONSTRUCTION

MAJOR MILESTONES	The Link (Steel)	The Link (Concrete)	Corn Silos (Concrete)	Water Rings (Steel)
Excavation & Foundations 	8 weeks	8 weeks	5.5 weeks	5.5 weeks
Building Skeleton 	15 weeks	20 weeks	14 weeks	16 weeks
Weather Tight Building 	23 weeks	27 weeks	23 weeks	25 weeks
Finished Building 	10.5 months	12 months	11 months	11 months

CONSTRUCTION

ESTIMATES

	The Link (Concrete)	The Link (Steel)	Corn Silos (Concrete)	Water Rings (Steel)
Total Costs	$7,650,000	$7,810,000	$7,160,000	$7,490,000

CONSTRUCTION

LEED REVIEW

Best Case Scenario: GOLD

Worst Case Scenario: CERTIFIED

Estimated Cost Premiums

Level of Green Standard	Average Green Cost Premium
Level 1 – Certified	0.66%
Level 2 – Silver	2.11%
Level 3 – Gold	1.82%
Level 4 – Platinum	6.50%
Average	1.84%

Source: USGBC

Greatest Potential in “Sustainable Sites”

Up to 15 Points Available for “Living Wall”

ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture

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MEP

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Sustainability Review

Integrated Project Delivery

FLEXIBILITY

- Flexible Layout
- Moveable Walls
- Minimal Shear Walls
- Minimum Interior Columns
- Fully Composite Floor System
- Long Life Span

RECYCABLE/RENEWABLE MATERIALS

- Steel: ArcelorMittal – Chicago, IL (150 miles)
- Steel: 97.5% Recycled
- Steel: Easily Expandable Structure
- Concrete: Precast –Wieser Concrete – Maiden Rock, WI (220 miles)
- Concrete: Industrial By-Products

ADDITIONAL

- LCA – Concrete vs. Steel
- Water Efficiency
- Construction Waste Management
- Stack Effect
- Natural Daylighting
- Voided Slab
- Wisconsin's *"Focus On Energy"* Financial Incentives

ATLANTIC TEAM

CYBER PRESENTATION

March 12, 2010

Architecture

Engineering

MEP

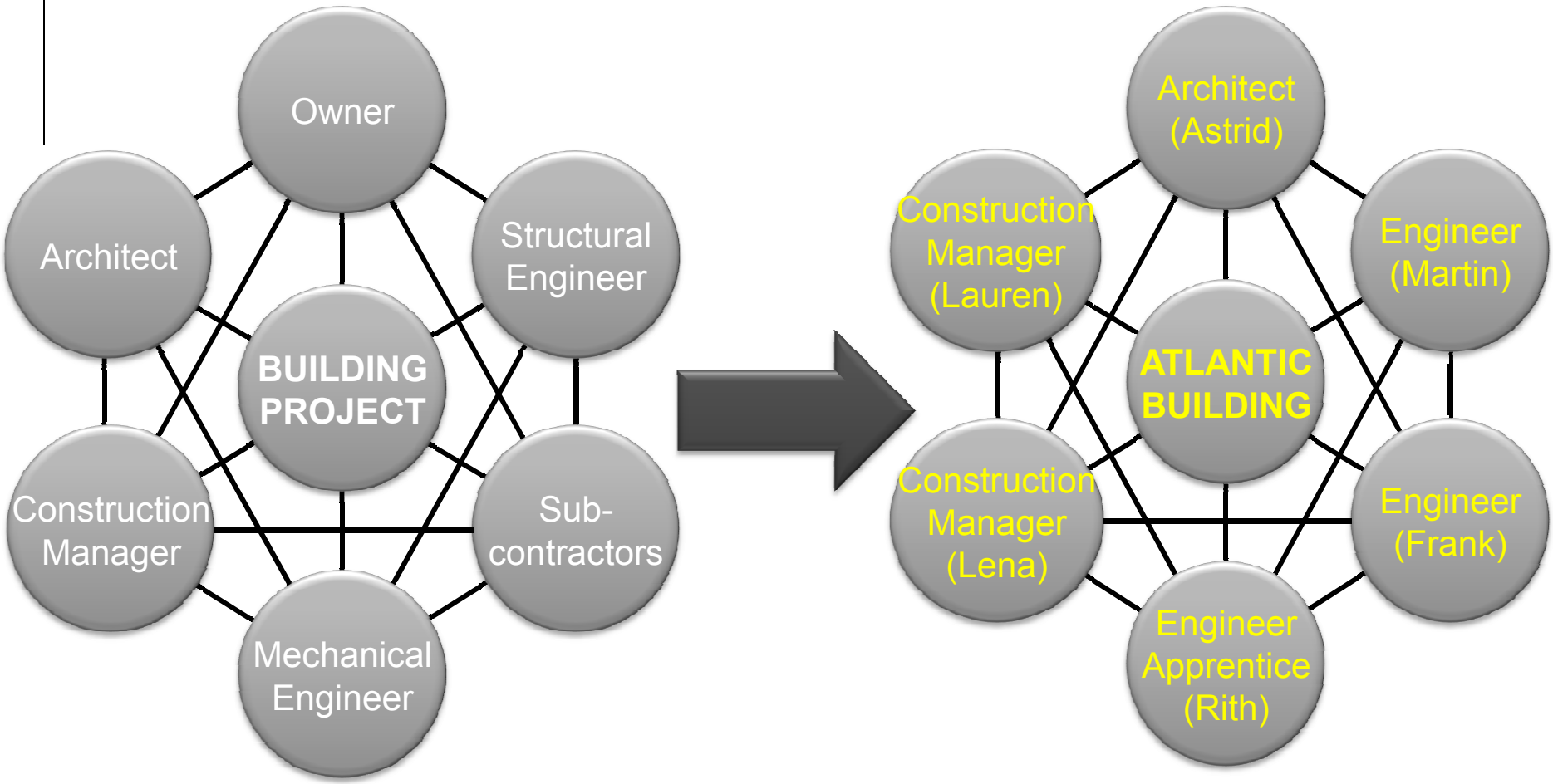
Construction

Sustainability Review

Integrated Project Delivery

INTEGRATED PROJECT DELIVERY

ATLANTIC TEAM



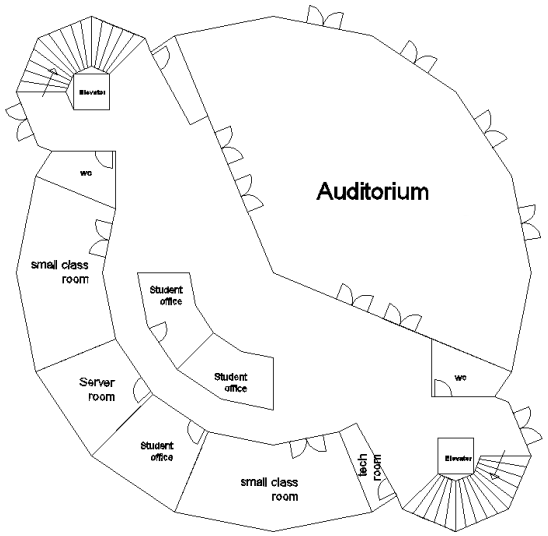
DISCIPLINE INTERACTION

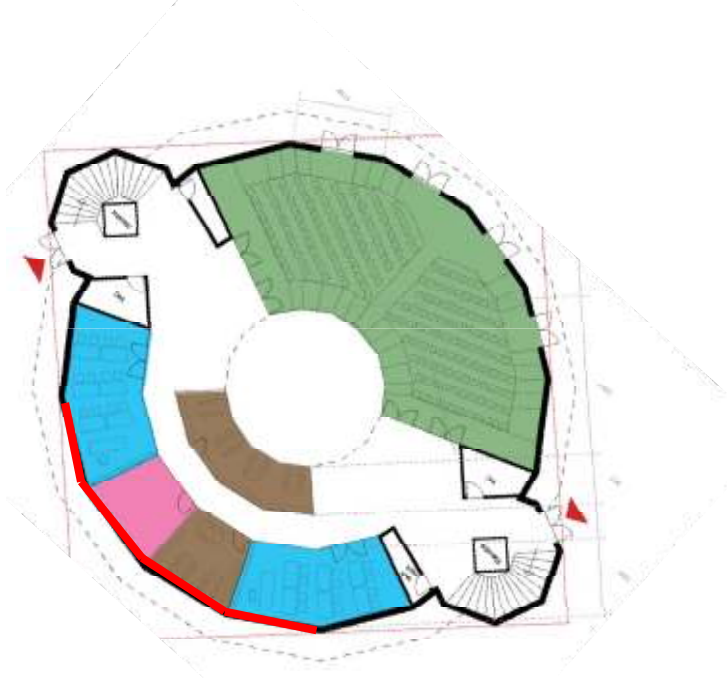
THE LINK:

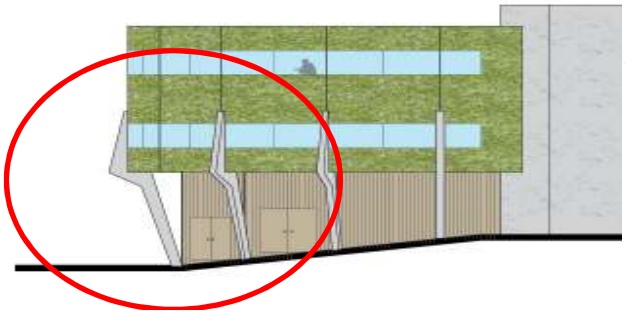
- Reduced cantilever sizes to accommodate structural design limitations

CORN SILOS/WATER RINGS:

- Circular building concept converted to segments of straight members to reduce construction complexities
- Slanted columns added to reduce cantilever effect
- Modified auditorium such that columns could be placed in symmetric fashion





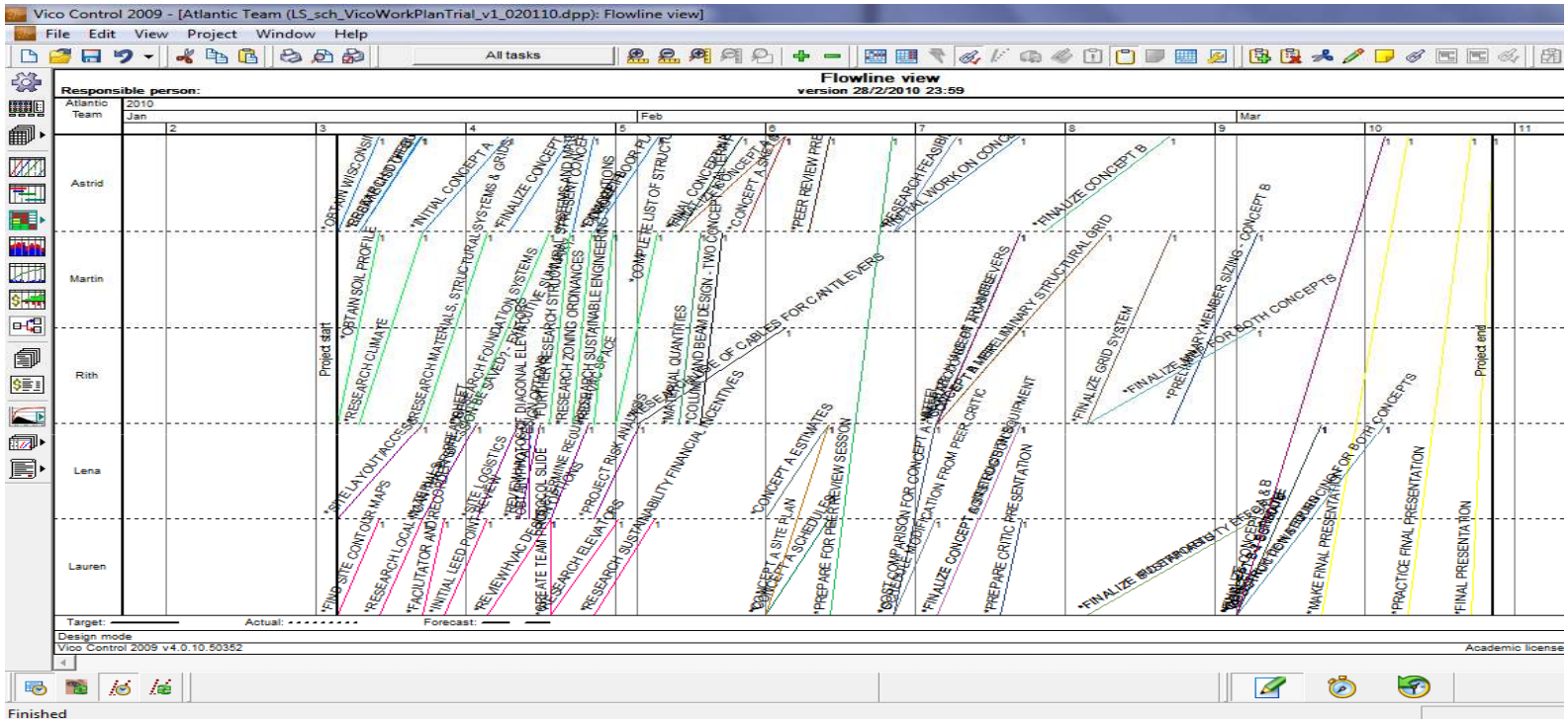


INTEGRATED PROJECT DELIVERY

TEAM PROTOCOLS

- Zero Email Policy *(Owners = exception)*
- Communication: Google Wave (Discussion), Dropbox (file sharing), Wiki (Information/Decisions)
- Weekly Group Meetings: GoToMeeting (Skype as backup), Recall
  - Rotating Schedule for the Facilitator and Recorder
- Biweekly Meetings with Owners
- Weekly 'Visible' Meetings: to be available for online interaction, discussions and questions
- Individual Team Member Waves: to provide daily updates on progress and notification of files added to Dropbox or wiki

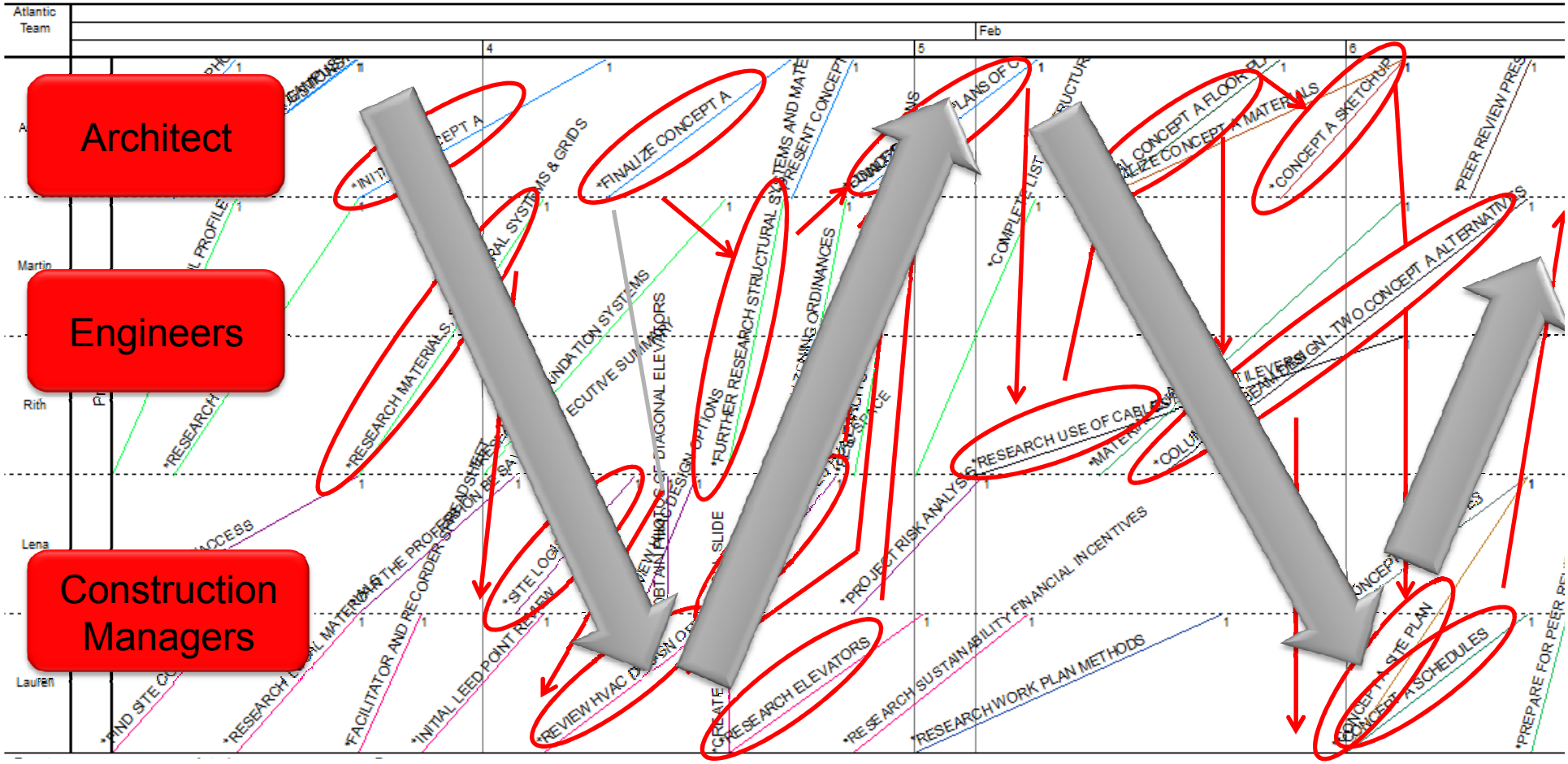
VICO CONTROL: TEAM WORK PLAN EXPERIMENT



- Location Based → People Based
  - Discipline Interaction
    - Flow of Activities

INTEGRATED PROJECT DELIVERY

VICO CONTROL: TEAM WORK PLAN EXPERIMENT



**Circular Flow of Activities

***Continuous* Process

WORK PLAN PROBLEMS AND REQUIRED IMPROVEMENTS

Problems

- Timely to create and keep updated
- No planned vs. as-completed
- Hard to see interaction between non-adjacent disciplines

Improvements

- Full schedule completed before project start date
- Update frequently
- Use in conjunction with activities checklist

IMPROVEMENT PLANS FOR SPRING QUARTER

- Spreadsheet based checklist

	A	B	C	D	E	F
1	ATLANTIC TEAM					
2	Project Checklist					
3						
4	**Activity**	**By Whom**	**For Whom**	**Start**	**Finish**	**Completed**
5	Determine Truck Turning Radius	Lena	Team	01-Mar-10	04-Mar-10	NO
6	Finalize Project's Sustainability Review	Lauren	Team	22-Feb-10	28-Feb-10	YES
7	Research Facade Materials	Astrid	Lena/Lauren	22-Feb-10	03-Mar-10	NO
8	Design Concept B Footings	Frank	Martin	22-Feb-10	03-Mar-10	NO
9	Draw MEP DistributioN Trees	Rith	Lena/Lauren	22-Feb-10	01-Mar-10	NO
10	Make Concept A - Steel Presentation Slides	Martin	Team	22-Feb-10	01-Mar-10	YES

- Update work plan frequently
- Document work completed in PowerPoint

CONCEPT ?

DECISION MATRIX

	The Link (Concrete)	The Link (Steel)	Corn Silos (Concrete)	Water Rings (Steel)
Flexibilty	2	2	4	4
Simplicity of Structural Design	1	1	4	4
Aesthetics	2	2	3	3
Sustainability	2	2	4	3
Site Disturbance	1	1	4	2
Costs	2	1	4	3
Symmetry	2	2	4	1
Length of Schedule	1	4	3	3
IPD	3	3	2	2
Feeling	2	1	3	3
Owners Preference	2	2	3	4
TOTAL	**20**	**21**	**38**	**32**

WATER RINGS – STEEL

FINAL DECISION

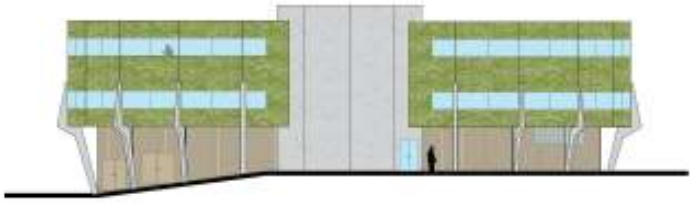
CYBER PRESENTATION

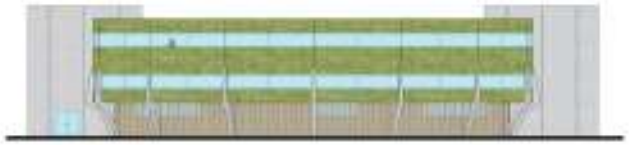
March 12, 2010

Extras

SILOS - CONCRETE

OUR PREFERENCE

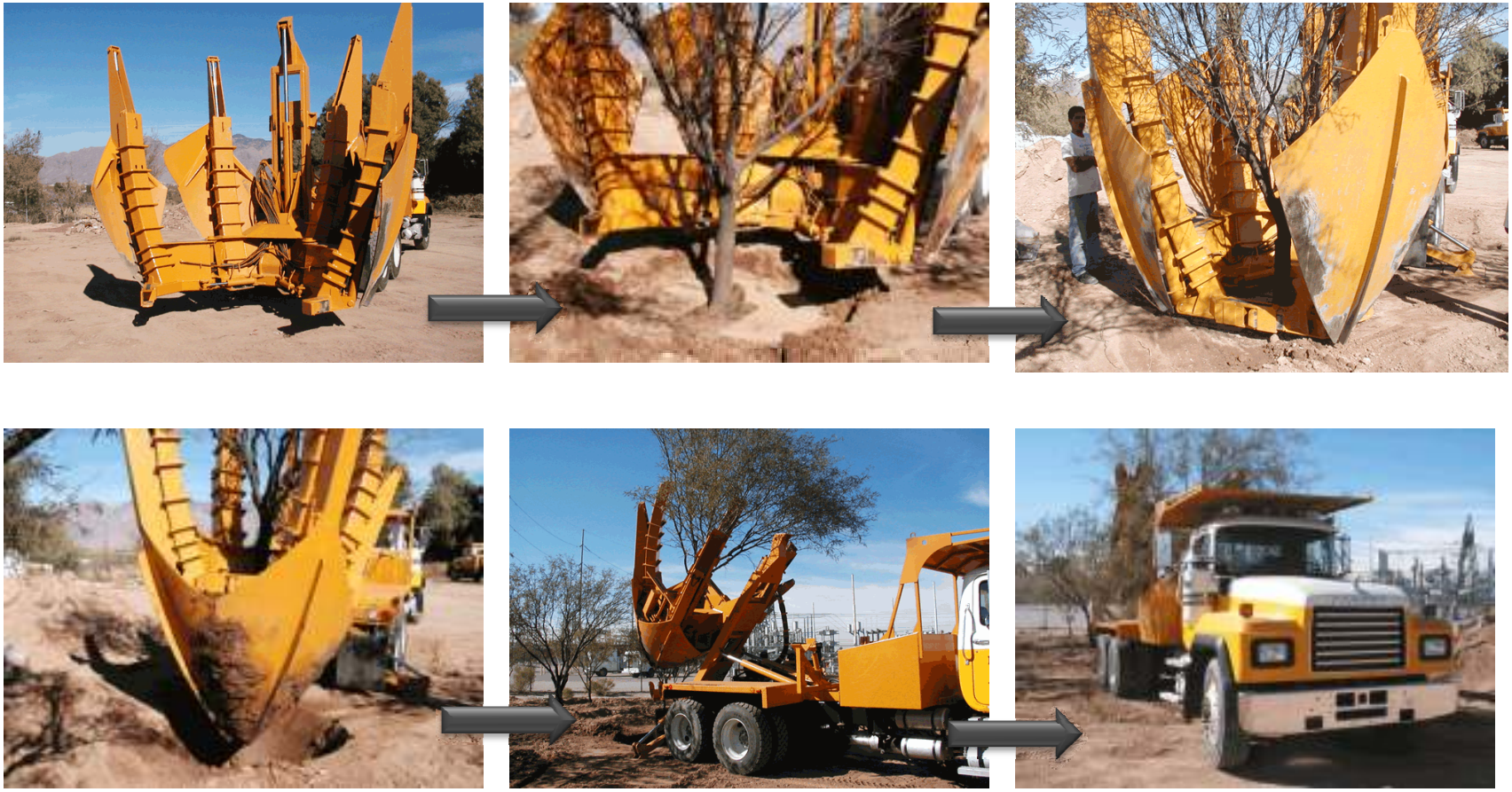




CONSTRUCTION

TREE REMOVAL SEQUENCE

(source: http://www.big-john.com/digging.htm)



Equipment can be truck, trailer or loader mounted; Numerous Tree Transporting Companies in Area

JUST-IN-TIME DELIVERIES

- Currently designed material components can be easily transported on standard trucks, as seen on the previous slide (Largest Structural Element = 38ft).
- To minimize congestion on the site, we will utilize ‘Just-in-time’ deliveries

This method will allow us to:

- reduce operating costs
- prevent over-production
- minimize waiting times and transport costs
- save resources by streamlining production systems
- reduce capital tied up in stock

TRANSPORT TRUCK LIMITATIONS

Understanding Wisconsin's TSW Laws
Weight and Size Limits

CAMBRIDGE

Weight Limits

Class A Highways

- 80,000 lbs. Gross Vehicle Weight (GVW)
- 20,000 lbs. GW for any single axle
- 34,000 lbs. for consecutive sets of tandem axles
- 11,000 lbs. GW per wheel

Bridge Weight limits posted by management agency (frequently local gov't)

Size Limits

Source: http://wcha.net/Resource-PDF/WI-Truck%20Study/WI_TSWS_overview_final.pdf

CONSTRUCTION

RISK ANALYSIS FOR THE PRODUCTION

	Risk	Risk type	P	C	PxC	Trend	Responsible person	Done	Measure risk minimization	Updated
1	Limit of expenditure exceeds	E	5	5	25	→			Active forecast work early cost estimations, cost focus for all continuous savings work. Not expense agreement. Ensure by early procurement. Simplify solutions and work preparation. **Not increasing trend from the current mode.**	2010-01-25 upd.
2	Complaints from tenants, restrictions of working time could cause delays and increased costs.	E	3	5	15	→			Communication, especially when disturbing works noise times occurs	2010-01-25 upd.
3	Delayed just-in-time deliveries	E, T, Te	4	5	20	→			Active forecast work planning, time focus.Simplify solutions and work preparation. **Not increasing trend from the current mode.**	2010-01-25 upd.
4	Lack of resources, labor, material	E, T, Te	3	4	12	↓			Keep existing staff and locate resources on the market. **The probability decreases**	2010-01-25 upd.
5	Personal injury on the 3rd man	W	3	5	15	→			Barriers to the surrounding areas. Attention to the shortcomings, and constantly be aware.	2010-01-25 upd.
6	Narrow site	T,W, E	3	4	12	→			Detailed delivery planning, Board on the project office. **Probability means. Not downward trend.**	2010-01-25 upd.
7	Lack of management resources	T,E, Te	3	5	15	→			Location manager as well as additional planning resource contractor. Is the installation coordination adequate?	2010-01-25 upd.
8	Commitment of the staff (focus)	E	2	4	8	→			Early design by assets, even with contractors. Teambuilding/Kick-off. Focus on teamwork and individually assets.	2010-01-25 upd.
9	The right entrepreneurs (specialist)	T,Te,E	1	4	4	↓			Participation from the owner and specialist consultants. **Probability is low. The trend will decrease.**	2010-01-25 upd.
10	Do not finish at deadline	T, Te, E	4	5	20	→			Early production planning, frequent reconciliations of time plans and focus from the Steering Group. Supervise the schedual constantly.	2010-01-25 upd.
11	Lack of coordination contracts	T,Te,E	3	5	15	→			The preparation	2010-01-25 upd.
12	Complaints from neighbors	E	3	3	9	→			Communication, especially when disruptive activities, meetings. Correctly check certain information right. "Week-mail" to those who wants' information during the production.**The probability decreases. Downward trend**	2010-01-25 upd.
13	The working environment in production	W, E, T	2	5	10	→			Security patrols, working environment meetings.	2010-01-25 upd.
14	Not good accessibility to the site	W, T	4	4	16	→			Continuous building cleaning. Focus on the issue in the working environment meetings and briefings. Responsible supervisors appointed for sanitation. **Horizontal trend**	2010-01-25 upd.
15	Late decision/changes	T,Te,E	4	4	16	→			Clarify the consequences of change. **Horizontal trend**	2010-01-25 upd.
16	Damage and burglary.	Te, E, T	3	4	12	→			Extended guarding towards the project end. Accuracy with locks and alarm. **Horizontal trend**	2010-01-25 upd.

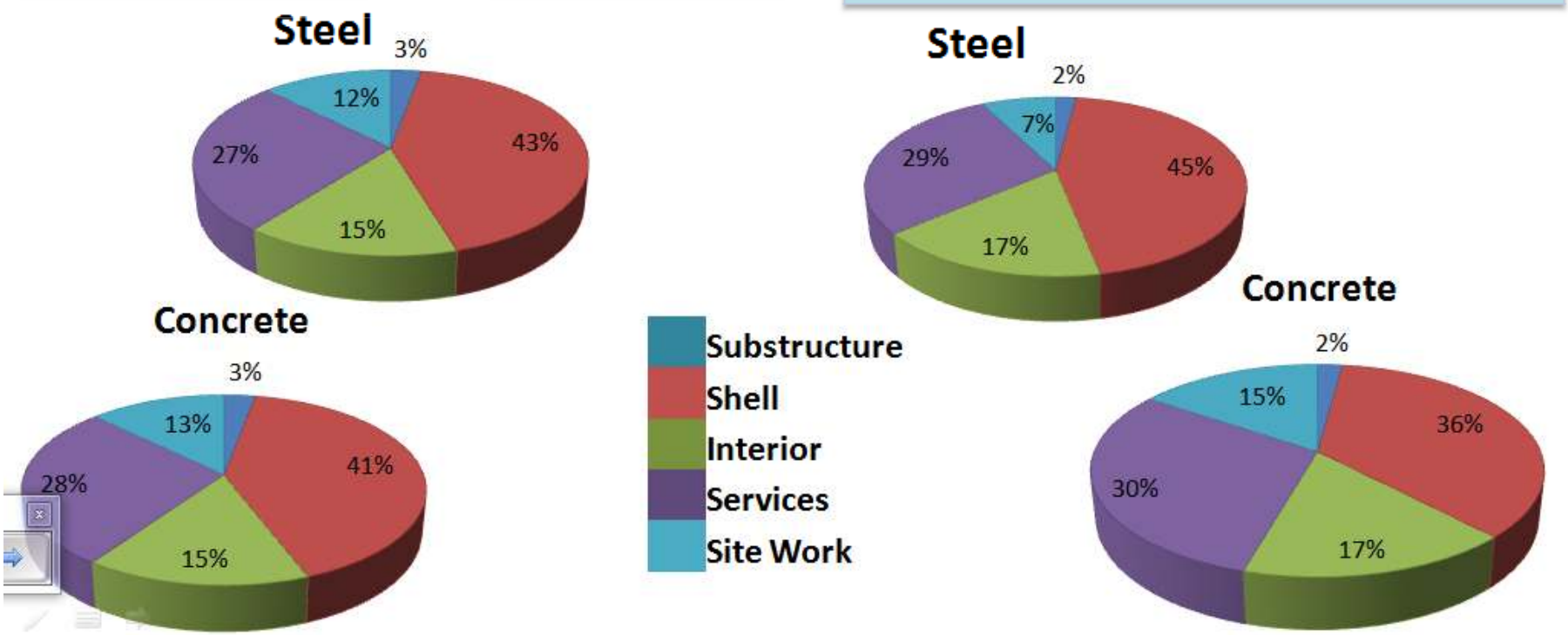
P = Probability, (scale 1 - 5 (where 5 has the highest probability and 1 has the lowest probability)
C = Consequence, scale 1 - 5, (where 5 has the highest consequence and 1 has the lowest consequence)

CONSTRUCTION

COST BREAKDOWN

	The Link (Steel)	The Link (Concrete)
Substructure	$225,000	$225,000
Shell	$3,316,594	$3,151,587
Interior	$1,188,719	$1,188,719
Services	$2,111,500	$2,111,500
Site Work	$969,950	$969,950
Total	$7,811,763	$7,646,756

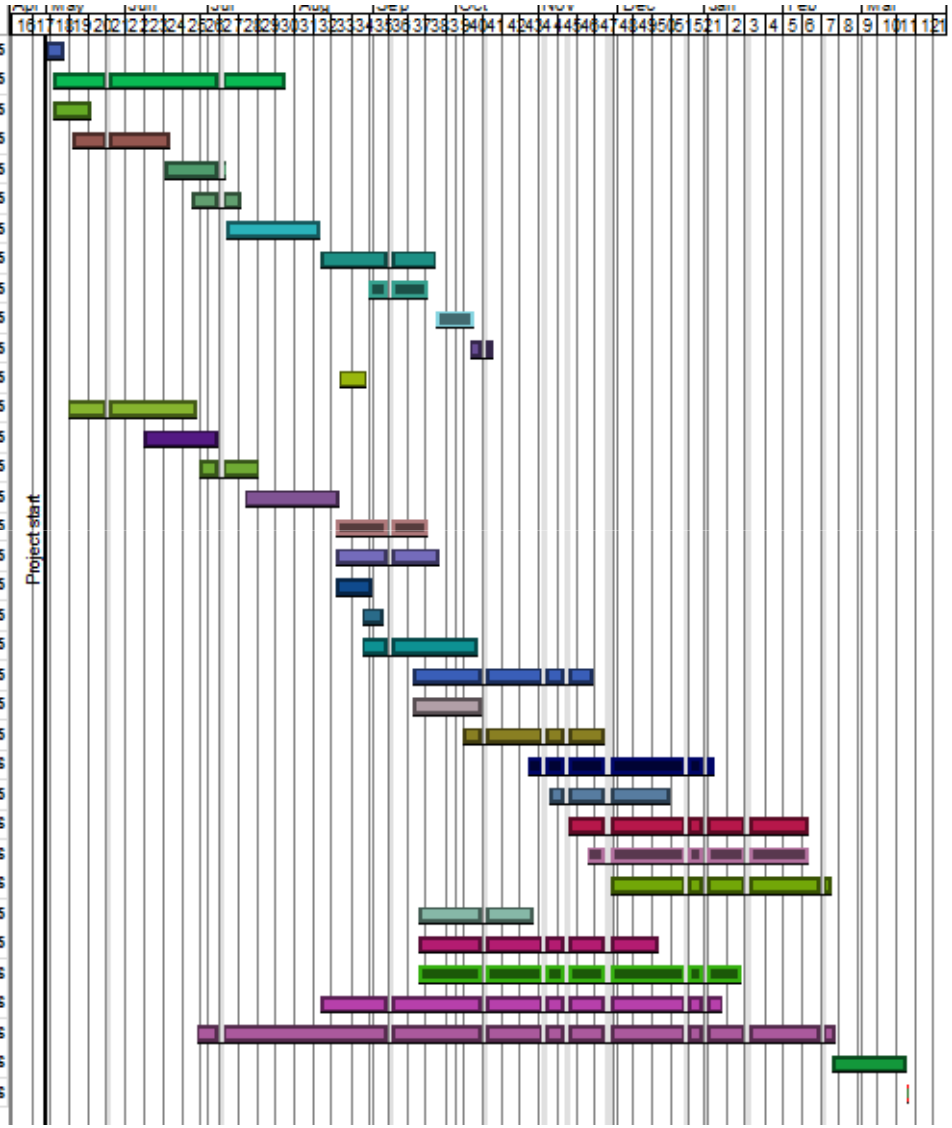
	Water Rings (Steel)	Corn Soils (Concrete)
Substructure	$153 956	$152 618
Shell	$3 354 270	$2 560 200
Interior	$1 263 034	$1 184 487
Services	$2 153 730	$2 153 730
Site Work	$562 275	$1 109 087
Total	$7 487 265	$7 160 121



CONSTRUCTION

SCHEDULE – THE LINK (STEEL)

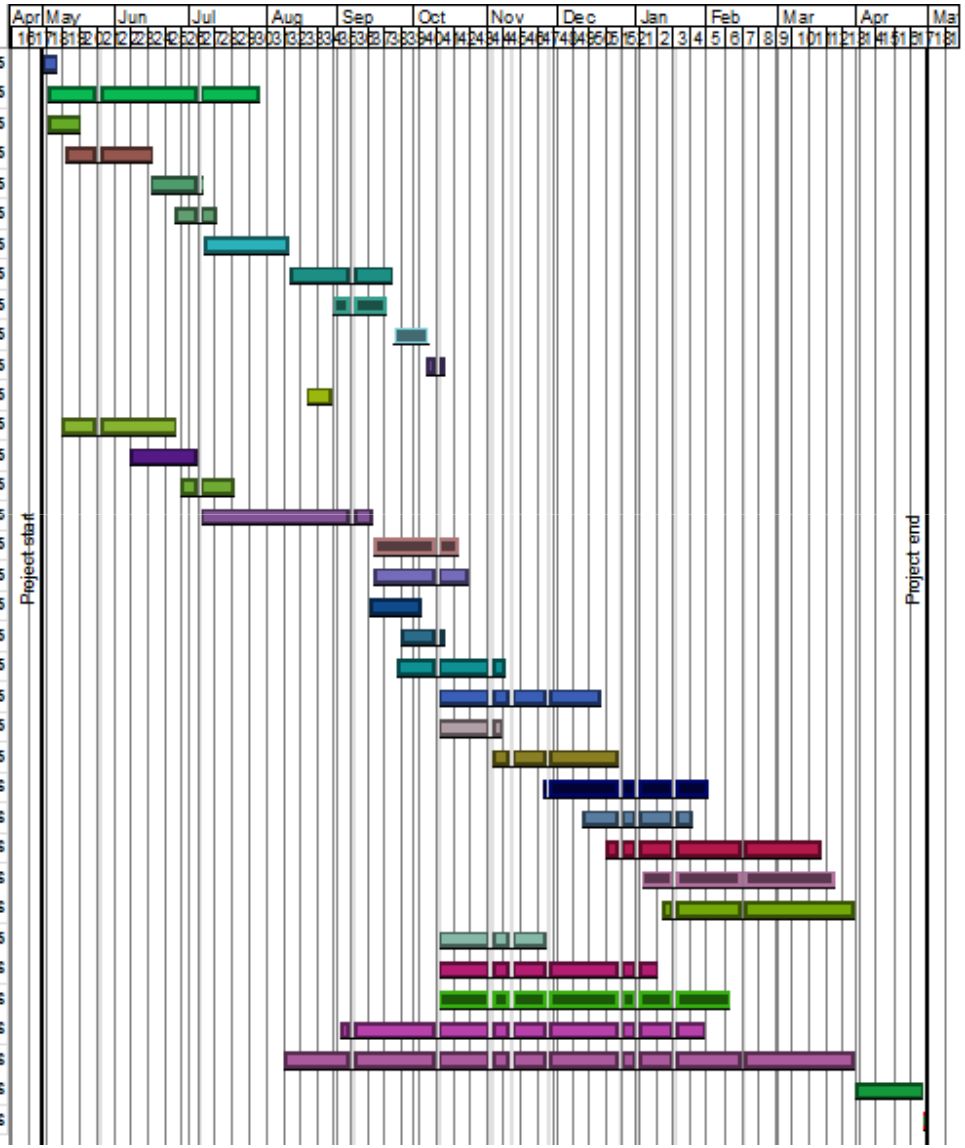
+1		*MOBILIZATION	(5)	1/5/2015	7/5/2015
+2		*EROSION CONTROL MEASURES	(60)	5/5/2015	29/7/2015
+3		*EXCAVATION - FOUNDATIONS	(10)	5/5/2015	18/5/2015
+4		*INSTALL WATER AND SEWER MAINS & LATERALS	(25)	12/5/2015	16/6/2015
+5		*ELECTRICAL CONDUIT	(15)	16/6/2015	7/7/2015
+6		*LIGHT BASES	(12)	25/6/2015	13/7/2015
+7		*PLACE TYPE 1&2 GRAVELS	(25)	8/7/2015	11/8/2015
+8		*CONCRETE CURBS/SIDEWALKS & PADS	(30)	12/8/2015	23/9/2015
+9		*GUARDRAILS & SIGNS	(15)	31/8/2015	21/9/2015
+10		*ASPHALT PAVING	(10)	24/9/2015	7/10/2015
+11		*LINE PAINTING	(5)	7/10/2015	14/10/2015
+12		*BUILDING CONSTUCTION	(7.5)	19/8/2015	28/8/2015
+13		*FOUNDATION	(33)	11/5/2015	25/6/2015
+14		*BACKFILL	(20)	8/6/2015	3/7/2015
+15		*INTERIOR MECHANICAL EXCAVATION	(15)	29/6/2015	20/7/2015
+16		*STRUCTURAL STEEL	(25)	15/7/2015	18/8/2015
+17		*ROOF PARAPETS	(24)	18/8/2015	21/9/2015
+18		*ROOFING	(27)	18/8/2015	24/9/2015
+19		*SLAB ON GRADE	(10)	18/8/2015	31/8/2015
+20		*SLABS	(6)	27/8/2015	3/9/2015
+21		*EXTERIOR WALL FRAMING & CURTAIN WALL	(30)	27/8/2015	8/10/2015
+22		*DRYWALL PARITIONS	(45)	16/9/2015	20/11/2015
+23		*EXTERIOR WINDOWS	(18)	16/9/2015	9/10/2015
+24		*SIDING - GREEN WALL BASE	(35)	5/10/2015	25/11/2015
+25		*ACOUSTICAL CEILINGS	(45)	28/10/2015	5/1/2016
+26		*INTERIOR DOORS	(30)	5/11/2015	18/12/2015
+27		*INTERIOR PAINTING	(60)	12/11/2015	9/2/2016
+28		*FLOORING	(55)	19/11/2015	9/2/2016
+29		*MILL WORK	(55)	27/11/2015	17/2/2016
+30		*ELEVATOR	(30)	17/9/2015	29/10/2015
+31		*SPRINKLER SYSTEMS	(60)	17/9/2015	15/12/2015
+32		*HVAC DIFFUSERS/GRILLES	(80)	17/9/2015	14/1/2016
+33		*PLUMBING SYSTEMS	(100)	12/8/2015	7/1/2016
+34		*ELECTRICAL SYSTEMS	(160)	26/6/2015	18/2/2016
+35		*TESTING AND INSPECTION	(20)	18/2/2016	16/3/2016
+36		*OCCUPANCY & TURNOVER TO OWNER	(1)	17/3/2016	17/3/2016



CONSTRUCTION

SCHEDULE – THE LINK (CONCRETE)

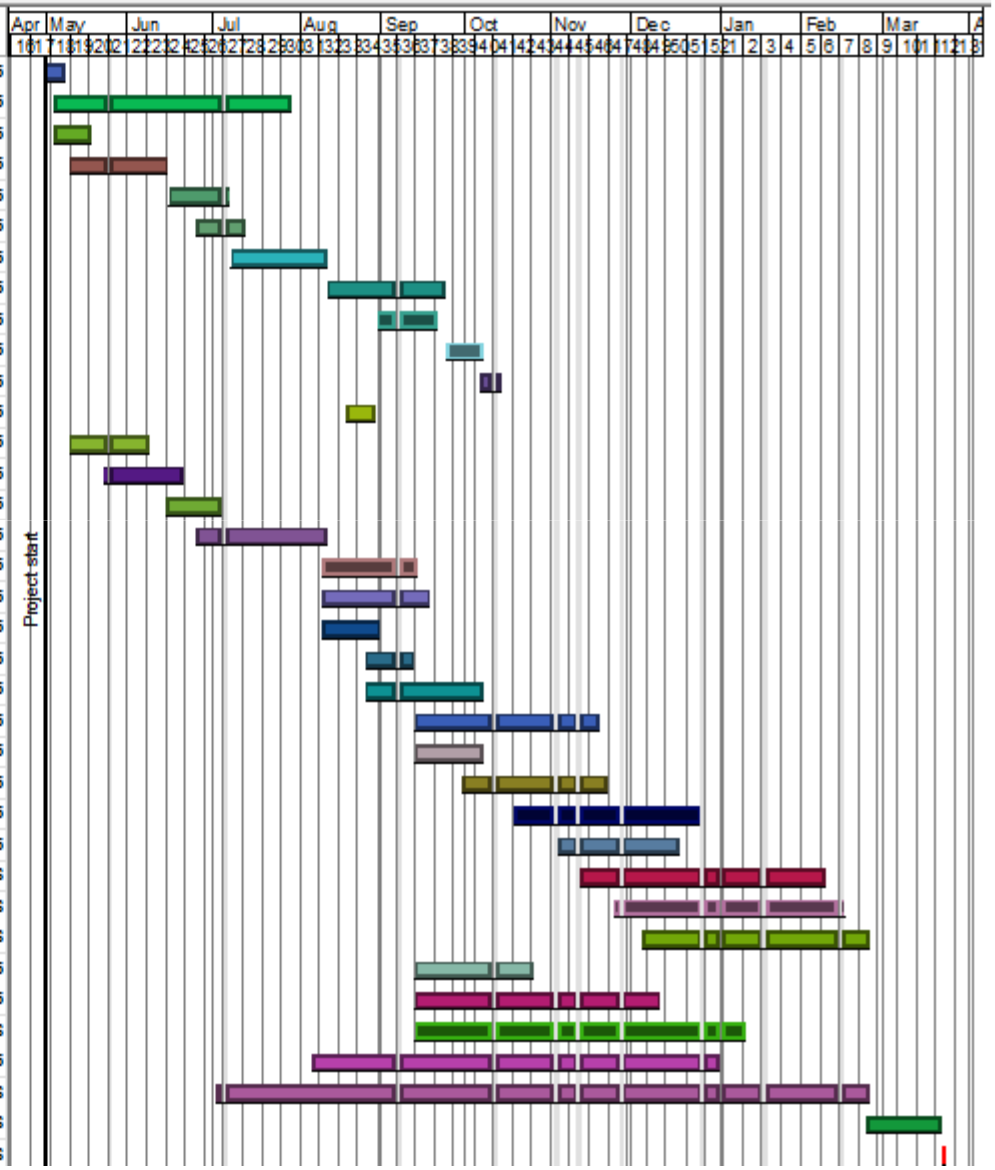
+1		*MOBILIZATION	(5)	1/5/2015	7/5/2015
+2		*EROSION CONTROL MEASURES	(60)	5/5/2015	29/7/2015
+3		*EXCAVATION - FOUNDATIONS	(10)	5/5/2015	18/5/2015
+4		*INSTALL WATER AND SEWER MAINS & LATERALS	(25)	12/5/2015	16/6/2015
+5		*ELECTRICAL CONDUIT	(15)	16/6/2015	7/7/2015
+6		*LIGHT BASES	(12)	25/6/2015	13/7/2015
+7		*PLACE TYPE 1&2 GRAVELS	(25)	8/7/2015	11/8/2015
+8		*CONCRETE CURBS/SIDEWALKS & PADS	(30)	12/8/2015	23/9/2015
+9		*GUARDRAILS & SIGNS	(15)	31/8/2015	21/9/2015
+10		*ASPHALT PAVING	(10)	24/9/2015	7/10/2015
+11		*LINE PAINTING	(5)	7/10/2015	14/10/2015
+12		*BUILDING CONSTUCTION	(7.5)	19/8/2015	28/8/2015
+13		*FOUNDATION	(33)	11/5/2015	25/6/2015
+14		*BACKFILL	(20)	8/6/2015	3/7/2015
+15		*INTERIOR MECHANICAL EXCAVATION	(15)	29/6/2015	20/7/2015
+16		*FORM STRUCTURE	(50)	7/7/2015	15/9/2015
+17		*ROOF PARAPETS	(24)	16/9/2015	20/10/2015
+18		*ROOFING	(27)	16/9/2015	23/10/2015
+19		*GRAVEL UNDER SLAB PLACEMENT	(15)	15/9/2015	5/10/2015
+20		*SLAB ON GRADE	(12)	28/9/2015	14/10/2015
+21		*EXTERIOR WALL FRAMING & CURTAIN WALL	(30)	25/9/2015	9/11/2015
+22		*DRYWALL PARITIONS	(45)	13/10/2015	17/12/2015
+23		*EXTERIOR WINDOWS	(18)	13/10/2015	6/11/2015
+24		*SIDING - GREEN WALL BASE	(35)	4/11/2015	24/12/2015
+25		*ACOUSTICAL CEILINGS	(45)	25/11/2015	1/2/2016
+26		*INTERIOR DOORS	(30)	10/12/2015	25/1/2016
+27		*INTERIOR PAINTING	(60)	21/12/2015	17/3/2016
+28		*FLOORING	(55)	5/1/2016	23/3/2016
+29		*MILL WORK	(55)	13/1/2016	31/3/2016
+30		*ELEVATOR	(30)	13/10/2015	25/11/2015
+31		*SPRINKLER SYSTEMS	(60)	13/10/2015	11/1/2016
+32		*HVAC DIFFUSERS/GRILLES	(80)	13/10/2015	9/2/2016
+33		*PLUMBING SYSTEMS	(100)	2/5/2015	29/1/2016
+34		*ELECTRICAL SYSTEMS	(160)	10/8/2015	31/3/2016
+35		*TESTING AND INSPECTION	(20)	1/4/2016	28/4/2016
+36		*OCCUPANCY & TURNOVER TO OWNER	(1)	29/4/2016	29/4/2016



CONSTRUCTION

SCHEDULE – CORN SILOS (CONCRETE)

1	*MOBILIZATION	(5)	1/5/2015	7/5/2015
2	*EROSION CONTROL MEASURES	(60)	5/5/2015	25/7/2015
3	*EXCAVATION - FOUNDATIONS	(10)	5/5/2015	18/5/2015
4	*INSTALL WATER AND SEWER MAINS & LATERALS	(25)	11/5/2015	15/6/2015
5	*ELECTRICAL CONDUIT	(15)	16/6/2015	7/7/2015
6	*LIGHT BASES	(12)	25/6/2015	13/7/2015
7	*PLACE TYPE 1&2 GRAVELS	(25)	8/7/2015	11/8/2015
8	*CONCRETE CURBS/SIDEWALKS & PADS	(30)	12/8/2015	23/9/2015
9	*GUARDRAILS & SIGNS	(15)	31/8/2015	21/9/2015
10	*ASPHALT PAVING	(10)	24/9/2015	7/10/2015
11	*LINE PAINTING	(5)	7/10/2015	14/10/2015
12	*BUILDING CONSTUCTION	(7.5)	19/8/2015	28/8/2015
13	*FOUNDATION	(20)	11/5/2015	8/6/2015
14	*BACKFILL	(20)	22/5/2015	19/6/2015
15	*INTERIOR MECHANICAL EXCAVATION	(15)	15/6/2015	3/7/2015
16	*FORM STRUCTURE	(33)	25/6/2015	11/8/2015
17	*ROOF PARAPETS	(24)	11/8/2015	14/9/2015
18	*ROOFING	(27)	11/8/2015	17/9/2015
19	*GRAVEL UNDER SLAB PLACEMENT	(15)	11/8/2015	31/8/2015
20	*SLAB ON GRADE	(12)	26/8/2015	11/9/2015
21	*EXTERIOR WALL FRAMING & CURTAIN WALL	(30)	26/8/2015	7/10/2015
22	*DRYWALL PARITIONS	(45)	14/9/2015	18/11/2015
23	*EXTERIOR WINDOWS	(18)	14/9/2015	7/10/2015
24	*SIDING - GREEN WALL BASE	(35)	30/9/2015	20/11/2015
25	*ACOUSTICAL CEILINGS	(45)	20/10/2015	24/12/2015
26	*INTERIOR DOORS	(30)	4/11/2015	17/12/2015
27	*INTERIOR PAINTING	(60)	12/11/2015	9/2/2016
28	*FLOORING	(55)	25/11/2015	16/2/2016
29	*MILLWORK	(55)	4/12/2015	24/2/2016
30	*ELEVATOR	(30)	14/9/2015	26/10/2015
31	*SPRINKLER SYSTEMS	(60)	14/9/2015	10/12/2015
32	*HVAC DIFFUSERS/GRILLES	(80)	14/9/2015	11/1/2016
33	*PLUMBING SYSTEMS	(100)	6/8/2015	31/12/2015
34	*ELECTRICAL SYSTEMS	(160)	2/7/2015	24/2/2016
35	*TESTING AND INSPECTION	(20)	24/2/2016	22/3/2016
36	*OCCUPANCY & TURNOVER TO OWNER	(1)	23/3/2016	23/3/2016



CONSTRUCTION

SCHEDULE – WATER RINGS(STEEL)

+1		*MOBILIZATION	(5)	1/5/2015	7/5/2015
+2		*EROSION CONTROL MEASURES	(60)	5/5/2015	29/7/2015
+3		*EXCAVATION - FOUNDATIONS	(6)	5/5/2015	12/5/2015
+4		*INSTALL WATER AND SEWER MAINS & LATERALS	(25)	11/5/2015	15/6/2015
+5		*ELECTRICAL CONDUIT	(15)	12/6/2015	2/7/2015
+6		*LIGHT BASES	(12)	23/6/2015	9/7/2015
+7		*PLACE TYPE 1&2 GRAVELS	(25)	7/7/2015	10/8/2015
+8		*CONCRETE CURBS/SIDEWALKS & PADS	(30)	10/8/2015	21/9/2015
+9		*GUARDRAILS & SIGNS	(15)	28/8/2015	18/9/2015
+10		*ASPHALT PAVING	(10)	18/9/2015	1/10/2015
+11		*LINE PAINTING	(5)	1/10/2015	7/10/2015
+12		*BUILDING CONSTUCTION	(7.5)	19/8/2015	28/8/2015
+13		*FOUNDATION	(22)	7/5/2015	8/6/2015
+14		*BACKFILL	(20)	22/5/2015	19/6/2015
+15		*INTERIOR MECHANICAL EXCAVATION	(15)	15/6/2015	3/7/2015
+16		*STRUCTURAL STEEL	(40)	1/7/2015	26/8/2015
+17		*ROOF PARAPETS	(24)	26/8/2015	29/9/2015
+18		*ROOFING	(27)	26/8/2015	2/10/2015
+19		*SLAB ON GRADE	(15)	26/8/2015	16/9/2015
+20		*SLABS	(12)	10/9/2015	25/9/2015
+21		*EXTERIOR WALL FRAMING & CURTAIN WALL	(30)	10/9/2015	22/10/2015
+22		*DRYWALL PARITIONS	(45)	28/9/2015	3/12/2015
+23		*EXTERIOR WINDOWS	(18)	28/9/2015	22/10/2015
+24		*SIDING - GREEN WALL BASE	(35)	16/10/2015	8/12/2015
+25		*ACOUSTICAL CEILINGS	(45)	4/11/2015	11/1/2016
+26		*INTERIOR DOORS	(30)	12/11/2015	24/12/2015
+27		*INTERIOR PAINTING	(60)	18/11/2015	16/2/2016
+28		*FLOORING	(55)	27/11/2015	17/2/2016
+29		*MILLWORK	(55)	7/12/2015	25/2/2016
+30		*ELEVATOR	(30)	28/9/2015	10/11/2015
+31		*SPRINKLER SYSTEMS	(60)	28/9/2015	24/12/2015
+32		*HVAC DIFFUSERS/GRILLES	(80)	28/9/2015	26/1/2016
+33		*PLUMBING SYSTEMS	(100)	24/8/2015	20/1/2016
+34		*ELECTRICAL SYSTEMS	(160)	3/7/2015	25/2/2016
+35		*TESTING AND INSPECTION	(20)	26/2/2016	24/3/2016
+36		*OCCUPANCY & TURNOVER TO OWNER	(1)	25/3/2016	25/3/2016